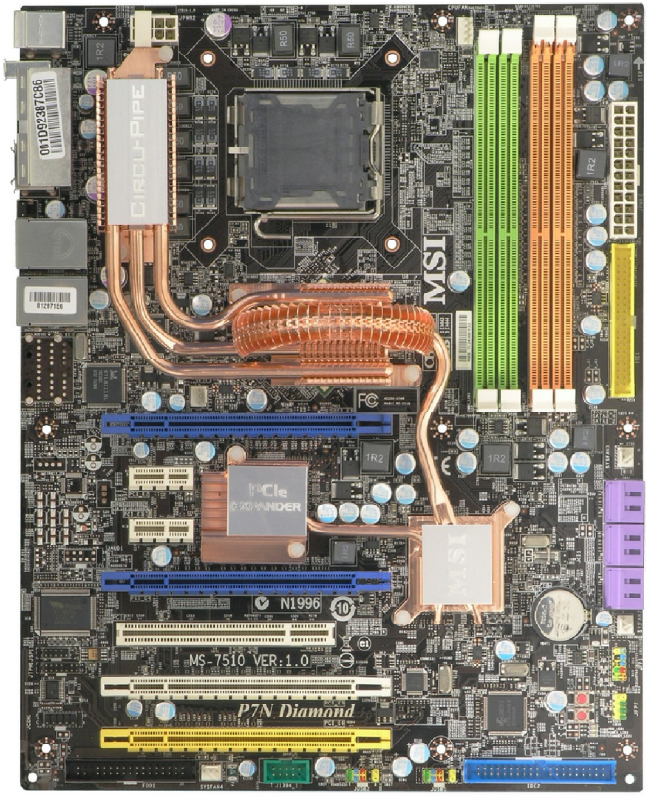
MSI
MICRO-STAR INTERNATIONAL

P7N Diamond series

MS-7510 (v1.X) Mainboard



G52-75101X1

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Revision History

Revision	Revision History	Date
V1.0	First release	December 2007

Technical Support

If a problem arises with your system and no solution can be obtained from the user's manual, please contact your place of purchase or local distributor. Alternatively, please try the following help resources for further guidance.

- Visit the MSI website for FAQ, technical guide, BIOS updates, driver updates, and other information: ***http://global.msi.com.tw/index.php?func=faqIndex***
- Contact our technical staff at: ***http://support.msi.com.tw/***

Safety Instructions

1. Always read the safety instructions carefully.
2. Keep this User's Manual for future reference.
3. Keep this equipment away from humidity.
4. Lay this equipment on a reliable flat surface before setting it up.
5. The openings on the enclosure are for air convection hence protects the equipment from overheating. DO NOT COVER THE OPENINGS.
6. Make sure the voltage of the power source and adjust properly 110/220V before connecting the equipment to the power inlet.
7. Place the power cord such a way that people can not step on it. Do not place anything over the power cord.
8. Always Unplug the Power Cord before inserting any add-on card or module.
9. All cautions and warnings on the equipment should be noted.
10. Never pour any liquid into the opening that could damage or cause electrical shock.
11. If any of the following situations arises, get the equipment checked by a service personnel:
    - † The power cord or plug is damaged.
    - † Liquid has penetrated into the equipment.
    - † The equipment has been exposed to moisture.
    - † The equipment has not work well or you can not get it work according to User's Manual.
    - † The equipment has dropped and damaged.
    - † The equipment has obvious sign of breakage.
12. DO NOT LEAVE THIS EQUIPMENT IN AN ENVIRONMENT UNCONDITIONED, STORAGE TEMPERATURE ABOVE 60^0C (140^0F), IT MAY DAMAGE THE EQUIPMENT.

CAUTION: Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer.

警告使用者:
這是甲類的資訊產品，在居住的環境中使用時，可能會造成無線電干擾，在這種情況下，使用者會被要求採取某些適當的對策。

廢電池請回收

For better environmental protection, waste batteries should be collected separately for recycling or special disposal.

FCC-B Radio Frequency Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the measures listed below.

CE N1996

- † Reorient or relocate the receiving antenna.
- † Increase the separation between the equipment and receiver.
- † Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- † Consult the dealer or an experienced radio/television technician for help.

Notice 1

The changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Notice 2

Shielded interface cables and A.C. power cord, if any, must be used in order to comply with the emission limits.

VOIR LA NOTICE D'INSTALLATION AVANT DE RACCORDER AU RESEAU.

FC **Micro-Star International**
MS-7510

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) this device may not cause harmful interference, and

(2) this device must accept any interference received, including interference that may cause undesired operation.

WEEE (Waste Electrical and Electronic Equipment) Statement

ENGLISH

To protect the global environment and as an environmentalist, MSI must remind you that...

Under the European Union ("EU") Directive on Waste Electrical and Electronic Equipment, Directive 2002/96/EC, which takes effect on August 13, 2005, products of "electrical and electronic equipment" cannot be discarded as municipal waste anymore and manufacturers of covered electronic equipment will be obligated to take back such products at the end of their useful life. MSI will comply with the product take back requirements at the end of life of MSI-branded products that are sold into the EU. You can return these products to local collection points.

DEUTSCH

Hinweis von MSI zur Erhaltung und Schutz unserer Umwelt

Gemäß der Richtlinie 2002/96/EG über Elektro- und Elektronik-Altgeräte dürfen Elektro- und Elektronik-Altgeräte nicht mehr als kommunale Abfälle entsorgt werden. MSI hat europaweit verschiedene Sammel- und Recyclingunternehmen beauftragt, die in die Europäische Union in Verkehr gebrachten Produkte, am Ende seines Lebenszyklus zurückzunehmen. Bitte entsorgen Sie dieses Produkt zum gegebenen Zeitpunkt ausschliesslich an einer lokalen Altgerätesammelstelle in Ihrer Nähe.

FRANÇAIS

En tant qu'écologiste et afin de protéger l'environnement, MSI tient à rappeler ceci...

Au sujet de la directive européenne (EU) relative aux déchets des équipement électriques et électroniques, directive 2002/96/EC, prenant effet le 13 août 2005, que les produits électriques et électroniques ne peuvent être déposés dans les décharges ou tout simplement mis à la poubelle. Les fabricants de ces équipements seront obligés de récupérer certains produits en fin de vie. MSI prendra en compte cette exigence relative au retour des produits en fin de vie au sein de la communauté européenne. Par conséquent vous pouvez retourner localement ces matériels dans les points de collecte.

РУССКИЙ

Компания MSI предпринимает активные действия по защите окружающей среды, поэтому напоминаем вам, что....

В соответствии с директивой Европейского Союза (ЕС) по предотвращению загрязнения окружающей среды использованным электрическим и электронным оборудованием (директива WEEE 2002/96/EC), вступающей в силу 13 августа 2005 года, изделия, относящиеся к электрическому и электронному оборудованию, не могут рассматриваться как бытовой мусор, поэтому производители вышеперечисленного электронного оборудования обязаны принимать его для переработки по окончании срока службы. MSI обязуется соблюдать требования по приему продукции, проданной под маркой MSI на территории ЕС, в переработку по окончании срока службы. Вы можете вернуть эти изделия в специализированные пункты приема.

ESPAÑOL

MSI como empresa comprometida con la protección del medio ambiente, recomienda:
Bajo la directiva 2002/96/EC de la Unión Europea en materia de desechos y/o equipos electrónicos, con fecha de rigor desde el 13 de agosto de 2005, los productos clasificados como "eléctricos y equipos electrónicos" no pueden ser depositados en los contenedores habituales de su municipio, los fabricantes de equipos electrónicos, están obligados a hacerse cargo de dichos productos al termino de su período de vida. MSI estará comprometido con los términos de recogida de sus productos vendidos en la Unión Europea al final de su periodo de vida. Usted debe depositar estos productos en el punto limpio establecido por el ayuntamiento de su localidad o entregar a una empresa autorizada para la recogida de estos residuos.

NEDERLANDS

Om het milieu te beschermen, wil MSI u eraan herinneren dat....
De richtlijn van de Europese Unie (EU) met betrekking tot Vervuiling van Electrische en Electronische producten (2002/96/EC), die op 13 Augustus 2005 in zal gaan kunnen niet meer beschouwd worden als vervuiling.
Fabrikanten van dit soort producten worden verplicht om producten retour te nemen aan het eind van hun levenscyclus. MSI zal overeenkomstig de richtlijn handelen voor de producten die de merknaam MSI dragen en verkocht zijn in de EU. Deze goederen kunnen geretourneerd worden op lokale inzamelingspunten.

SRPSKI

Da bi zaštitili prirodnu sredinu, i kao preduzeće koje vodi računa o okolini i prirodnoj sredini, MSI mora da vas podesti da...
Po Direktivi Evropske unije ("EU") o odbačenoj ekektronskoj i električnoj opremi, Direktiva 2002/96/EC, koja stupa na snagu od 13. Avgusta 2005, proizvodi koji spadaju pod "elektronsku i električnu opremu" ne mogu više biti odbačeni kao običan otpad i proizvođači ove opreme biće prinuđeni da uzmu natrag ove proizvode na kraju njihovog uobičajenog veka trajanja. MSI će poštovati zahtev o preuzimanju ovakvih proizvoda kojima je istekao vek trajanja, koji imaju MSI oznaku i koji su prodati u EU. Ove proizvode možete vratiti na lokalnim mestima za prikupljanje.

POLSKI

Aby chronić nasze środowisko naturalne oraz jako firma dbająca o ekologię, MSI przypomina, że...
Zgodnie z Dyrektywą Unii Europejskiej ("UE") dotyczącą odpadów produktów elektrycznych i elektronicznych (Dyrektywa 2002/96/EC), która wchodzi w życie 13 sierpnia 2005, tzw. "produkty oraz wyposażenie elektryczne i elektroniczne " nie mogą być traktowane jako śmieci komunalne, tak więc producenci tych produktów będą zobowiązani do odbierania ich w momencie gdy produkt jest wycofywany z użycia. MSI wypełni wymagania UE, przyjmując produkty (sprzedawane na terenie Unii Europejskiej) wycofywane z użycia. Produkty MSI będzie można zwracać w wyznaczonych punktach zbiorczych.

TÜRKÇE

Çevreci özelliğiyle bilinen MSI dünyada çevreyi korumak için hatırlatır:

Avrupa Birliği (AB) Kararnamesi Elektrik ve Elektronik Malzeme Atığı, 2002/96/EC Kararnamesi altında 13 Ağustos 2005 tarihinden itibaren geçerli olmak üzere, elektrikli ve elektronik malzemeler diğer atıklar gibi çöpe atılamayacak ve bu elektonik cihazların üreticileri, cihazların kullanım süreleri bitttikten sonra ürünleri geri toplamakla yükümlü olacaktır. Avrupa Birliği'ne satılan MSI markalı ürünlerin kullanım süreleri bittiğinde MSI ürünlerin geri alınması isteği ile işbirliği içerisinde olacaktır. Ürünlerinizi yerel toplama noktalarına bırakabilirsiniz.

ČESKY

Záleží nám na ochraně životního prostředí - společnost MSI upozorňuje...

Podle směrnice Evropské unie ("EU") o likvidaci elektrických a elektronických výrobků 2002/96/EC platné od 13. srpna 2005 je zakázáno likvidovat "elektrické a elektronické výrobky" v běžném komunálním odpadu a výrobci elektronických výrobků, na které se tato směrnice vztahuje, budou povinni odebírat takové výrobky zpět po skončení jejich životnosti. Společnost MSI splní požadavky na odebírání výrobků značky MSI, prodávaných v zemích EU, po skončení jejich životnosti. Tyto výrobky můžete odevzdat v místních sběrnách.

MAGYAR

Annak érdekében, hogy környezetünket megvédjük, illetve környezetvédőként fellépve az MSI emlékezteti Önt, hogy ...

Az Európai Unió („EU") 2005. augusztus 13-án hatályba lépő, az elektromos és elektronikus berendezések hulladékairól szóló 2002/96/EK irányelve szerint az elektromos és elektronikus berendezések többé nem kezelhetőek lakossági hulladékként, és az ilyen elektronikus berendezések gyártói kötelessé válnak az ilyen termékek visszavételére azok hasznos élettartama végén. Az MSI betartja a termékvisszavétellel kapcsolatos követelményeket az MSI márkanév alatt az EU-n belül értékesített termékek esetében, azok élettartamának végén. Az ilyen termékeket a legközelebbi gyűjtőhelyre viheti.

ITALIANO

Per proteggere l'ambiente, MSI, da sempre amica della natura, ti ricorda che....

In base alla Direttiva dell'Unione Europea (EU) sullo Smaltimento dei Materiali Elettrici ed Elettronici, Direttiva 2002/96/EC in vigore dal 13 Agosto 2005, prodotti appartenenti alla categoria dei Materiali Elettrici ed Elettronici non possono più essere eliminati come rifiuti municipali: i produttori di detti materiali saranno obbligati a ritirare ogni prodotto alla fine del suo ciclo di vita. MSI si adeguerà a tale Direttiva ritirando tutti i prodotti marchiati MSI che sono stati venduti all'interno dell'Unione Europea alla fine del loro ciclo di vita. È possibile portare i prodotti nel più vicino punto di raccolta.

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Chapter 1
Getting Started

Thank you for choosing the P7N Diamond Series (MS-7510 v1.X) ATX mainboard. The P7N Diamond Series mainboards are based on **nVIDIA® nForce 780i SLI & 570i SLI** chipsets for optimal system efficiency. Designed to fit the advanced **Intel® Core 2 Extreme/ Quad/Duo, Pentium 4/D LGA775** processor, the P7N Diamond Series deliver a high performance and professional desktop platform solution.

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Mainboard Specifications

Processor Support

- Core 2 Extreme, Core 2 Quad, Core 2 Duo, Pentium 4, Pentium D 9XX, Pentium D 8XX,
- Supports 3/4 pin CPU Fan Pin-Header
- Supports EIST Technology
- Supports Hyper-Threading (HT) Technology
- Supports Intel Quad/ Dual/ Core Technology to 1333 MHz

(For the latest information about CPU, please visit http://global.msi.com.tw/index.php?func=cpuform)

Chipset

- North Bridge: nVIDIA® nForce 780i SLI chipset
- South Bridge: nVIDIA® nForce 570i SLI chipset

Memory Support

- DDR2 533/667/800/1066 SDRAM (8GB Max)
- 4 DDR2 DIMMs (240pin / 1.8V)

(For more information on compatible components, please visit http://global.msi.com.tw/index.php?func=testreport)

LAN

- Supports Daul 10/100/1000 Fast Ethernet by Realtek® RTL8211BL

IEEE 1394

- Chip integrated by JMB 381
- Transfer rate is up to 400Mbps
- Supports up to 2 ports (rear x 1, front x 1 ports)

Audio

Creative® SB X-Fi Xtreme H/W Audio Card (MS-4132)

- 24-bit / 96KHz audio quality
- 100dB SNR clarity
- Up to 7.1 CH EAX 5.0 Surround Sound

IDE

- 2 IDE controllers (IDE1 by nVIDIA nForce570i SLI, IDE2 by JMB363)
- PIO Bus Master Support Ultra DMA133/100/66 operation modes
- Supports up to 4 IDE devices

SATA

- 6 SATA II ports by nForce 570i SLI
- Supports transfer rate up to 300 MB/s

RAID

- SATA1~6 support RAID 0/ 1/ 5/ 0+1/ JBOD

Floppy

- 1 floppy port
- Supports 1 FDD with 360KB, 720KB, 1.2MB, 1.44MB and 2.88MB

Connectors

- **Back panel**
  - 1 PS/2 mouse port
  - 1 PS/2 keyboard port
  - 2 eSATA ports
  - 6 USB 2.0 Ports
  - 2 LAN jacks (10/100/1000)
  - 1 1394 port
  - 1 Clear CMOS button

- **On-Board Pinheaders/ Connectors**
  - 2 USB 2.0 pinheaders (4 ports)
  - 1 chassis intrusion
  - 1 1394 pinheader
  - 6 SATAII connectors
  - 1 serial port pinheader (COM1)
  - 1 TPM pinheader

Slots

- 4 PCI Express x16 slots
  * PCIE_1/4 supports Gen2 X16 band width
  * PCIE_5 it supports Gen1 X16 band width
  * PCIE_6 it supports Gen1 X8 band width
- 2 PCI Express x1 slots
- 1 PCI slot (Support 3.3V/ 5V PCI bus Interface)

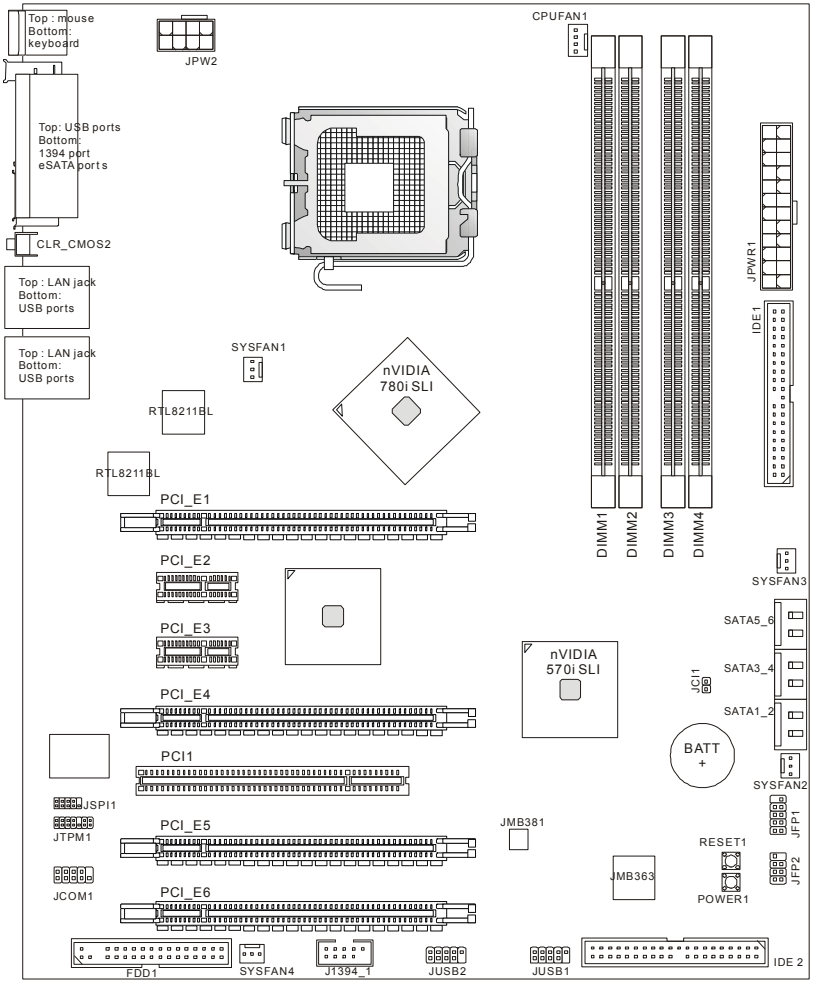
Form Factor

- ATX (30.4cm X 24.5cm)

Mounting

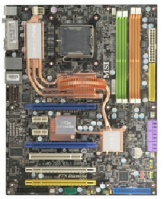
- 9 mounting holes

Mainboard Layout

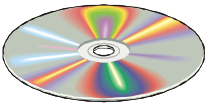


P7N Diamond Series
(MS-7510 V1.X) ATX Mainboard

Packing Checklist



MSI motherboard



MSI Driver/Utility CD

3-Way SLI bridge cables
(1 long, 2 short)

Power Cable

SATA Cable

IDE Cable

Floppy Cable

X-Fi Xtreme Audio Card
(optional)

1394+USB Bracket
(Optional)

User's Guide

Back IO Shield

* The pictures are for reference only and may vary from the packing contents of the product you purchased.

Chapter 2
Hardware Setup

This chapter provides you with the information about hardware setup procedures. While doing the installation, be careful in holding the components and follow the installation procedures. For some components, if you install in the wrong orientation, the components will not work properly.
Use a grounded wrist strap before handling computer components. Static electricity may damage the components.

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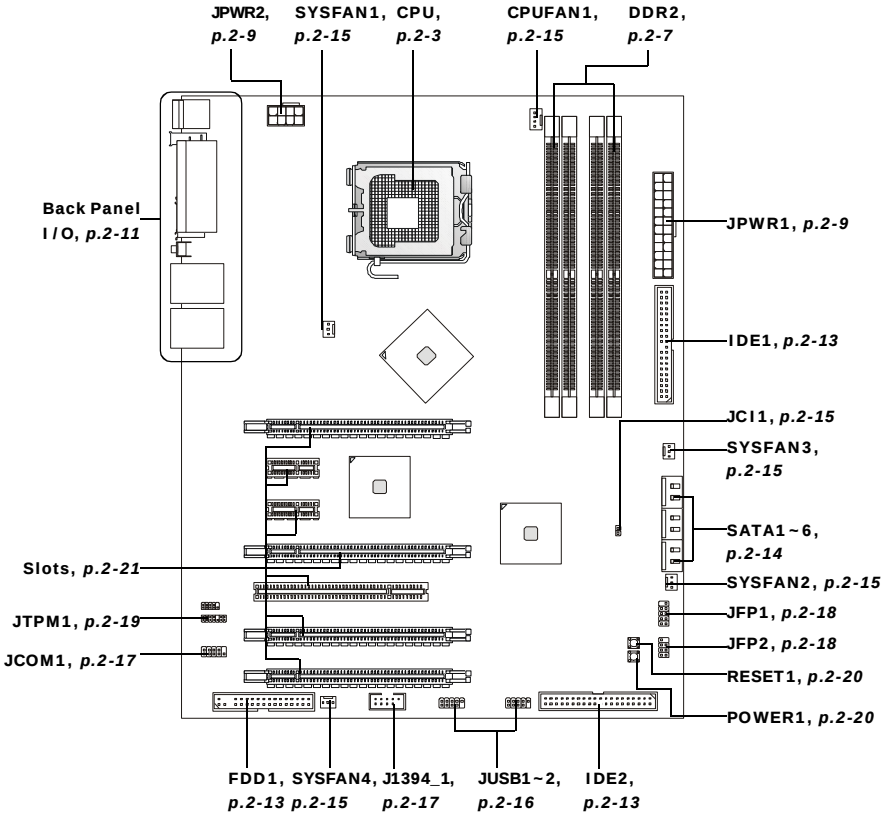
Quick Components Guide



CPU (Central Processing Unit)

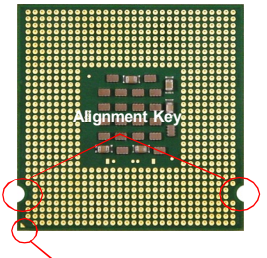
This mainboard supports Intel® CPU in LGA 775 package. When you are installing the CPU, **make sure to install the cooler to prevent overheating.** If you do not have the CPU cooler, consult your dealer before turning on the computer.
For the latest information about CPU, please visit *http://global.msi.com.tw/index.php?func=cpuform*

Important

Overheating
Overheating will seriously damage the CPU and system. Always make sure the cooling fan can work properly to protect the CPU from overheating. Make sure that you apply an even layer of thermal paste (or thermal tape) between the CPU and the heatsink to enhance heat dissipation.
Replaceing the CPU
While replacing the CPU, always turn off the ATX power supply or unplug the power supply's power cord from the grounded outlet first to ensure the safety of CPU.
Overclocking
This mainboard is designed to support overclocking. However, please make sure your components are able to tolerate such abnormal setting, while doing overclocking. Any attempt to operate beyond product specifications is not recommended. ***We do not guarantee the damages or risks caused by inadequate operation or beyond product specifications.***

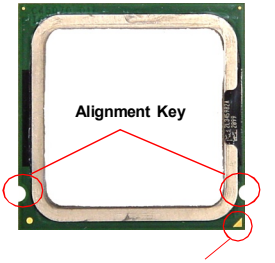
Introduction to LGA 775 CPU

The pin-pad side of LGA 775 CPU.



Yellow triangle is the Pin 1 indicator

The surface of LGA 775 CPU. Remember to apply some thermal paste on it for better heat dispersion.

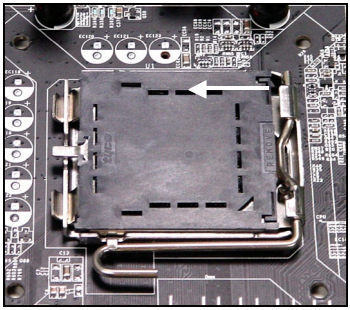


Yellow triangle is the Pin 1 indicator

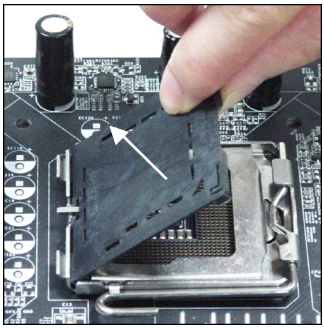
CPU & Cooler Installation

When you are installing the CPU, **make sure the CPU has a cooler attached on the top to prevent overheating.** Meanwhile, do not forget to apply some thermal paste on CPU before installing the heat sink/cooler fan for better heat dispersion. Follow the steps below to install the CPU & cooler correctly. Wrong installation will cause the damage of your CPU & mainboard.

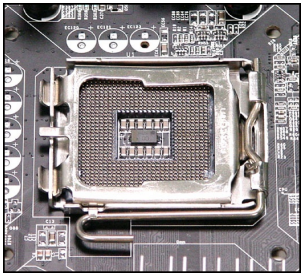
1. The CPU socket has a plastic cap on it to protect the contact from damage. Before you install the CPU, always cover it to protect the socket pin.



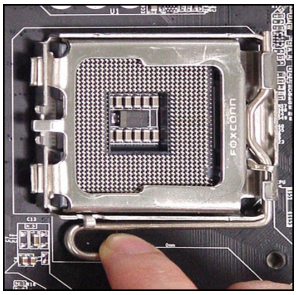
2. Remove the cap from lever hinge side (as the arrow shows).



3. The pins of socket reveal.



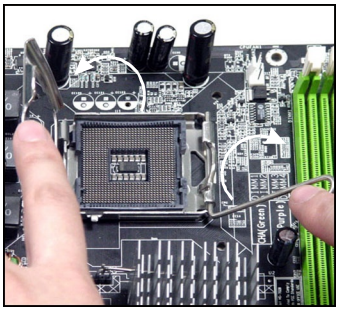
4. Open the load lever.



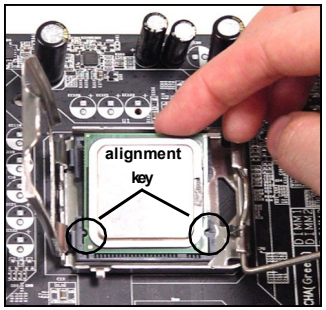
Important

1. Confirm if your CPU cooler is firmly installed before turning on your system.
2. Do not touch the CPU socket pins to avoid damaging.
3. The availability of the CPU land side cover depends on your CPU packing.

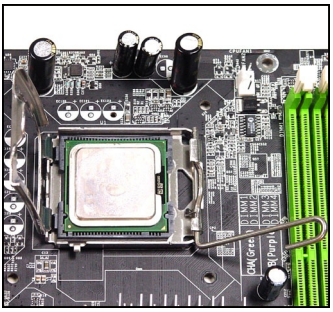
5. Lift the load lever up and open the load plate.



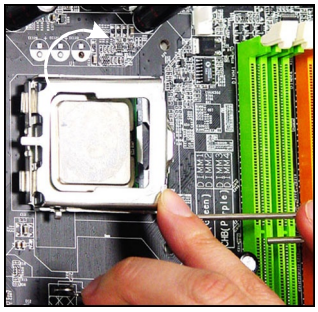
6. After confirming the CPU direction for correct mating, put down the CPU in the socket housing frame. Be sure to grasp on the edge of the CPU base. Note that the alignment keys are matched.



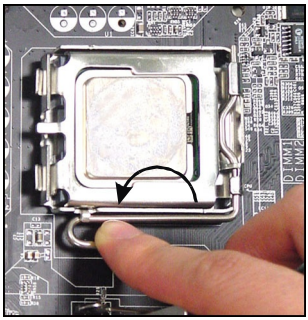
7. Visually inspect if the CPU is seated well into the socket. If not, take out the CPU with pure vertical motion and reinstall.



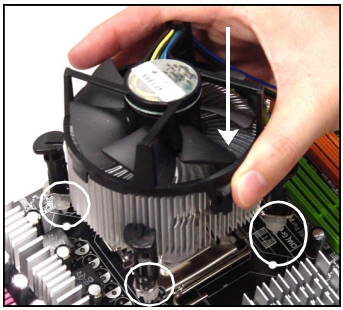
8. Cover the load plate onto the package.



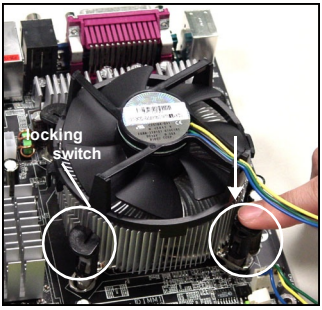
9. Press down the load lever lightly onto the load plate, and then secure the lever with the hook under retention tab.



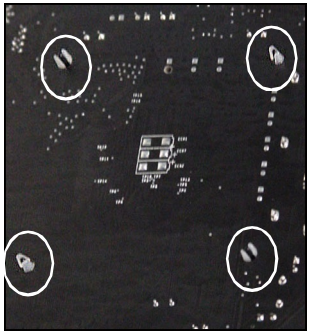
10. Align the holes on the mainboard with the heatsink. Push down the cooler until its four clips get wedged into the holes of the mainboard.



11. Press the four hooks down to fasten the cooler. Then rotate the locking switch (refer to the correct direction marked on it) to lock the hooks.



12. Turn over the mainboard to confirm that the clip-ends are correctly inserted.

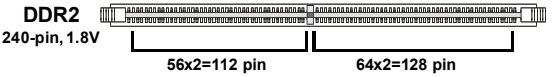


Important

1. Read the CPU status in BIOS (Chapter 3).
2. Whenever CPU is not installed, always protect your CPU socket pin with the plastic cap covered (shown in Figure 1) to avoid damaging.
3. Mainboard photos shown in this section are for demonstration of the CPU/ cooler installation only. The appearance of your mainboard may vary depending on the model you purchase.

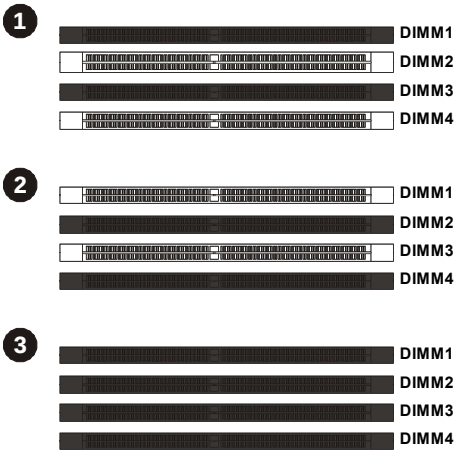
Memory

These DIMM slots are used for installing memory modules.
For more information on compatible components, please visit *http://global.msi.com.tw/index.php?func=testreport*



Dual-Channel Memory Population Rules

In Dual-Channel mode, the memory modules can transmit and receive data with two data bus lines simultaneously. Enabling Dual-Channel mode can enhance the system performance. Please refer to the following illustrations for population rules under Dual-Channel mode.



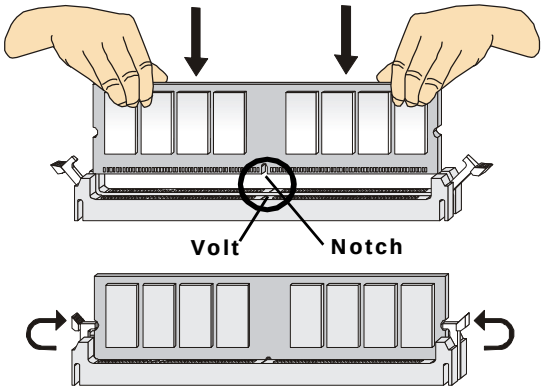
Installing DDR2 Modules

1. The memory module has only one notch on the center and will only fit in the right orientation.
2. Insert the memory module vertically into the DIMM slot. Then push it in until the golden finger on the memory module is deeply inserted in the DIMM slot.

Important

You can barely see the golden finger if the module is properly inserted in the DIMM slot.

3. The plastic clip at each side of the DIMM slot will automatically close.



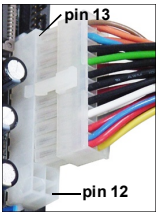
Important

- *DDR2 memory modules are not interchangeable with DDR and the DDR2 standard is not backwards compatible. You should always install DDR2 memory modules in the DDR2 DIMM slots.*
- *In Dual-Channel mode, make sure that you install memory modules of **the same type and density** in different channel DIMM slots.*
- *To enable successful system boot-up, always insert the memory modules into the **DIMM1 first.***

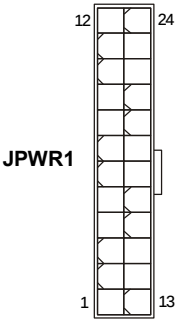
Power Supply

ATX 24-Pin Power Connector: JPWR1

This connector allows you to connect an ATX 24-pin power supply. To connect the ATX 24-pin power supply, make sure the plug of the power supply is inserted in the proper orientation and the pins are aligned. Then push down the power supply firmly into the connector.



You may use the 20-pin ATX power supply as you like. If you'd like to use the 20-pin ATX power supply, please plug your power supply along with pin 1 & pin 13 (refer to the image at the right hand). There is also a foolproof design on pin 11, 12, 23 & 24 to avoid wrong installation.

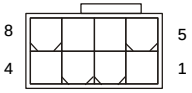


Pin Definition

PIN	SIGNAL	PIN	SIGNAL
1	+3.3V	13	+3.3V
2	+3.3V	14	-12V
3	GND	15	GND
4	+5V	16	PS-ON#
5	GND	17	GND
6	+5V	18	GND
7	GND	19	GND
8	PWROK	20	Res
9	5VSB	21	+5V
10	+12V	22	+5V
11	+12V	23	+5V
12	+3.3V	24	GND

ATX 12V Power Connector: JPWR2

This power connector is used to provide power to the CPU.



Pin Definition

PIN	SIGNAL	PIN	SIGNAL
1	GND	5	+12V
2	GND	6	+12V
3	GND	7	+12V
4	GND	8	+12V

Important

1. *Make sure that all the connectors are connected to proper ATX power supplies to ensure stable operation of the mainboard.*
2. *Power supply of 450 watts (and above) is highly recommended for system stability.*

Important Notification about Power Issue

NForce chipset is very sensitive to ESD (Electrostatic Discharge), therefore this issue mostly happens while the users intensively swap memory modules under S5 (power-off) states, and the power code is plugged while installing modules. Due to several pins are very sensitive to ESD, so this kind of memory-replacement actions might cause system chipset unable to boot. Please follow the following solution to avoid this situation.

Unplug the AC power cable (shown in figure 1) or unplug the power connectors (shown in figure 2 & figure 3) before the 1st installation or during system upgrade procedure.

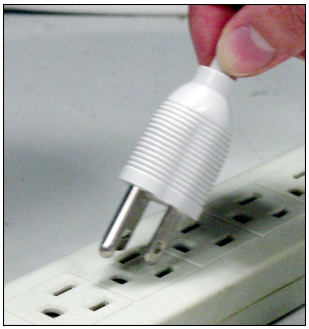


Figure 1:
Unplug the AC power cable

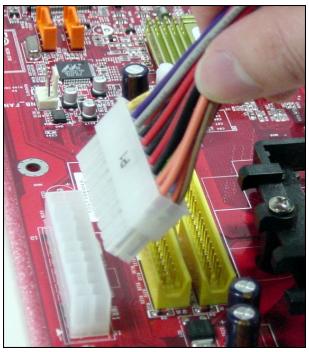


Figure 2:
Unplug the power connector

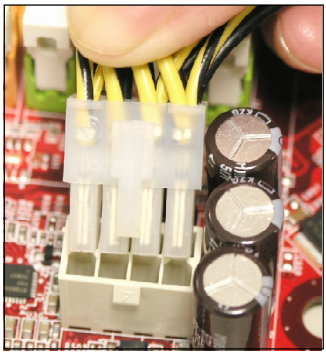
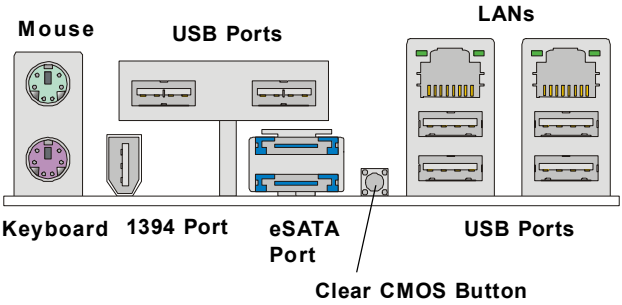


Figure 3:
Unplug the power connectors

Important

Mainboard photos shown in this section are for demonstration only. The appearance of your mainboard may vary depending on the model you purchase.

Back Panel

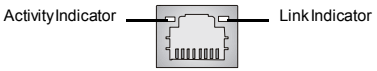


▶ Mouse / Keyboard
The standard PS/2® mouse/keyboard DIN connector is for a PS/2® mouse/keyboard.

▶ 1394 Port
The IEEE1394 port on the back panel provides connection to IEEE1394 devices.

▶ eSATA Port
This eSATA (External Serial ATA) port is used to connect the external SATA device. You can also use the optional external SATA cable to connect SATA device and eSATA port.

▶ LAN
The standard RJ-45 LAN jack is for connection to the Local Area Network (LAN). You can connect a network cable to it.



LED	Color	LED State	condition
Left	Orange	Off	LAN link is not established.
		On (steady state)	LAN link is established.
		On (brighter & pulsing)	The computer is communicating with another computer on the LAN.
Right	Green	Off	10 Mbit/sec data rate is selected.
		On	100 Mbit/sec data rate is selected.
	Orange	On	1000 Mbit/sec data rate is selected.

▶ USB Port
The USB (Universal Serial Bus) port is for attaching USB devices such as keyboard, mouse, or other USB-compatible devices.

► Clear CMOS Button

There is a CMOS RAM on board that has a power supply from external battery to keep the system configuration data. With the CMOS RAM, the system can automatically boot OS every time it is turned on. If you want to clear the system configuration, use the button to clear data. Press the button to clear the data.

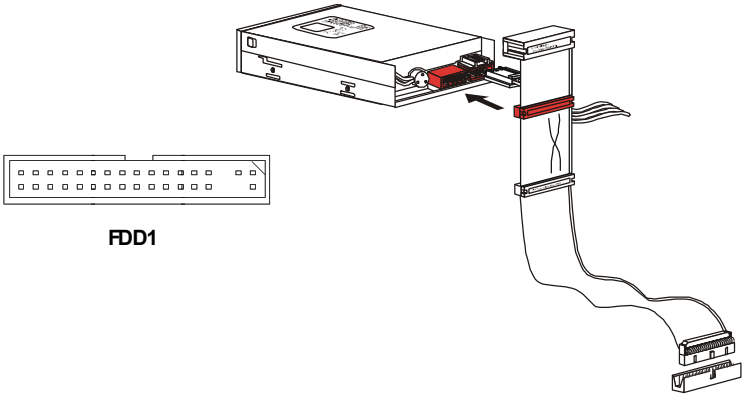
Important

Make sure that you power off the system before clearing CMOS data.

Connectors

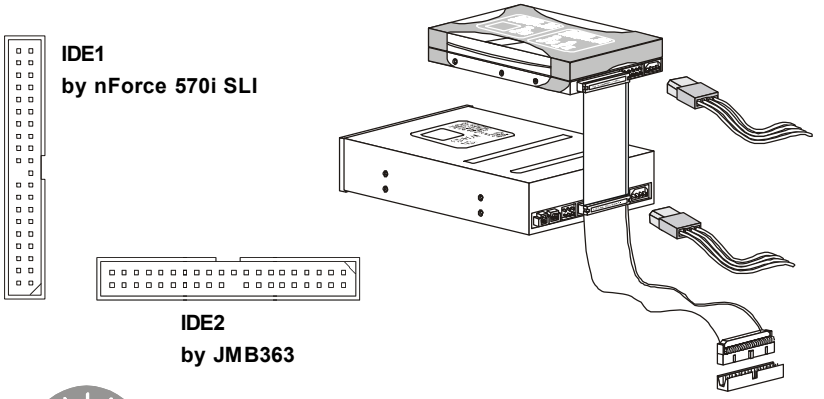
Floppy Disk Drive Connector: FDD1

This connector supports 360KB, 720KB, 1.2MB, 1.44MB or 2.88MB floppy disk drive.



IDE Connector: IDE1, IDE2

This connector supports IDE hard disk drives, optical disk drives and other IDE devices.

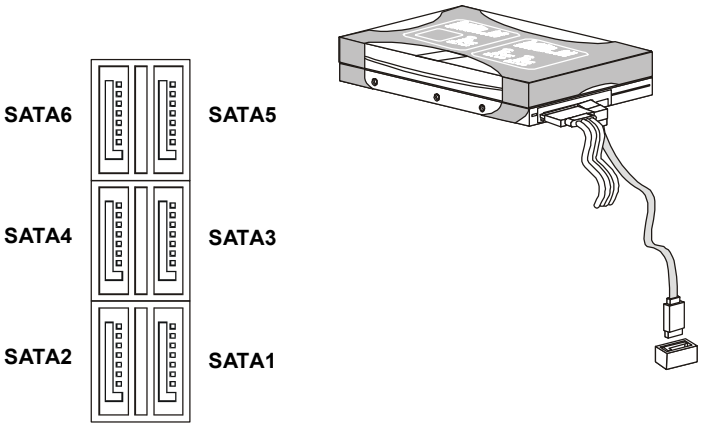


Important

If you install two IDE devices on the same cable, you must configure the drives separately to master / slave mode by setting jumpers. Refer to IDE device's documentation supplied by the vendors for jumper setting instructions.

Serial ATA Connector: SATA1~6

This connector is a high-speed Serial ATA interface port. Each connector can connect to one Serial ATA device.

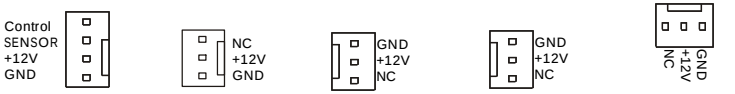


Important

Please do not fold the Serial ATA cable into 90-degree angle. Otherwise, data loss may occur during transmission.

Fan Power Connectors: CPUFAN1, SYSFAN1~4

The fan power connectors support system cooling fan with +12V. When connecting the wire to the connectors, always note that the red wire is the positive and should be connected to the +12V; the black wire is Ground and should be connected to GND. If the mainboard has a System Hardware Monitor chipset on-board, you must use a specially designed fan with speed sensor to take advantage of the CPU fan control.



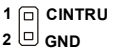
CPUFAN1 **SYSFAN1** **SYSFAN2** **SYSFAN3** **SYSFAN4**

Important

1. *Please refer to the recommended CPU fans at processor's official website or consult the vendors for proper CPU cooling fan.*
2. *CPUFAN1 supports fan control. You can install **Dual Core Center** utility that will automatically control the these fan speed according to the actual CPU and system temperature.*
3. *Fan/heatsink with 3 or 4 pins are both available for CPUFAN1.*

Chassis Intrusion Connector: JCI1

This connector connects to the chassis intrusion switch cable. If the chassis is opened, the chassis intrusion mechanism will be activated. The system will record this status and show a warning message on the screen. To clear the warning, you must enter the BIOS utility and clear the record.



JCI1

Front USB Connector: JUSB1 / JUSB2

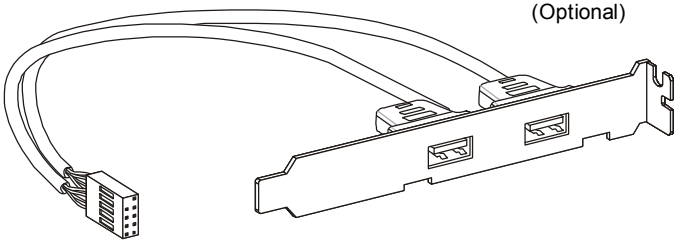
This connector, compliant with Intel® I/O Connectivity Design Guide, is ideal for connecting high-speed USB interface peripherals such as **USB HDD**, **digital cameras**, **MP3 players**, **printers**, **modems and the like**.

JUSB1~2

Pin Definition

PIN	SIGNAL	PIN	SIGNAL
1	VCC	2	VCC
3	USB0-	4	USB1-
5	USB0+	6	USB1+
7	GND	8	GND
9	Key (no pin)	10	USBOC

USB 2.0 Bracket
(Optional)

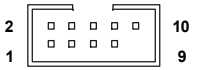


Important

Note that the pins of VCC and GND must be connected correctly to avoid possible damage.

IEEE1394 Connector: J1394_1

This connector allows you to connect the IEEE1394 device via an optional IEEE1394 bracket.

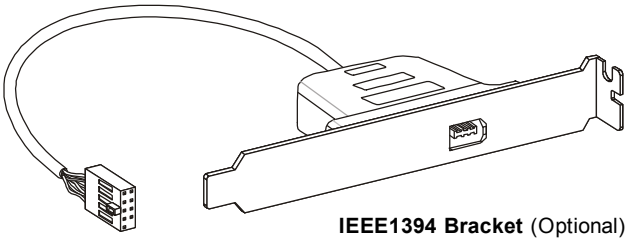


J1394_1

(The 1394 connector is in **Green** color.)

Pin Definition

PIN	SIGNAL	PIN	SIGNAL
1	TPA+	2	TPA-
3	Ground	4	Ground
5	TPB+	6	TPB-
7	Cable power	8	Cable power
9	Key (no pin)	10	Ground



IEEE1394 Bracket (Optional)

Serial Port Connector: JCOM1

This connector is a 16550A high speed communication port that sends/receives 16 bytes FIFOs. You can attach a serial device.

JCOM1

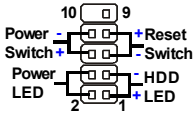
Pin Definition

PIN	SIGNAL	DESCRIPTION
1	DCD	Data Carry Detect
2	SIN	Serial In or Receive Data
3	SOUT	Serial Out or Transmit Data
4	DTR	Data Terminal Ready
5	GND	Ground
6	DSR	Data Set Ready
7	RTS	Request To Send
8	CTS	Clear To Send
9	RI	Ring Indicate

Front Panel Connectors: JFP1, JFP2

These connectors are for electrical connection to the front panel switches and LEDs. The JFP1 is compliant with Intel® Front Panel I/O Connectivity Design Guide.

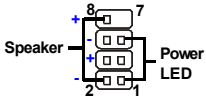
JFP1



JFP1 Pin Definition

PIN	SIGNAL	DESCRIPTION
1	HD_LED +	Hard disk LED pull-up
2	FP PWR/SLP	MSG LED pull-up
3	HD_LED -	Hard disk active LED
4	FP PWR/SLP	MSG LED pull-up
5	RST_SW -	Reset Switch low reference pull-down to GND
6	PWR_SW +	Power Switch high reference pull-up
7	RST_SW +	Reset Switch high reference pull-up
8	PWR_SW -	Power Switch low reference pull-down to GND
9	RSVD_DNU	Reserved. Do not use.

JFP2

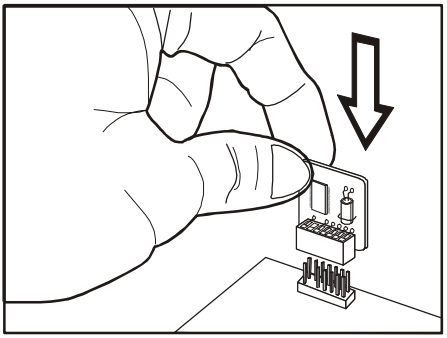


JFP2 Pin Definition

PIN	SIGNAL	DESCRIPTION
1	GND	Ground
2	SPK-	Speaker-
3	SLED	Suspend LED
4	BUZ+	Buzzer+
5	PLED	Power LED
6	BUZ-	Buzzer-
7	NC	No connection
8	SPK+	Speaker+

TPM Module Connector: JTPM1

This connector connects to a TPM (Trusted Platform Module) module (optional). Please refer to the TPM security platform manual for more details and usages.



Pin	Signal	Description	Pin	Signal	Description
1	LCLK	LPC clock	2	3V_STB	3V standby power
3	LRST#	LPC reset	4	VCC3	3.3V power
5	LAD0	LPC address & data pin0	6	SIRQ	Serial IRQ
7	LAD1	LPC address & data pin1	8	VCC5	5V power
9	LAD2	LPC address & data pin2	10	KEY	No pin
11	LAD3	LPC address & data pin3	12	GND	Ground
13	LFRAME#	LPC Frame	14	GND	Ground

Button

The motherboard provides the following buttons for you to set the computer's function. This section will explain how to change your motherboard's function through the use of button.

Power Button: POWER1

This power button is used to turn-on or turn-off the system. Press the button to turn-on or turn-off the system.

POWER1

Reset Button: RESET1

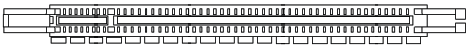
This reset button is used to reset the system. Press the button to reset the system.

RESET1

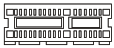
Slots

PCI (Peripheral Component Interconnect) Express Slot

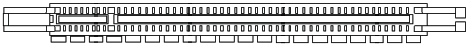
The PCI Express slot supports the PCI Express interface expansion card.
The PCI Express 2.0x 16 supports up to 8.0 GB/s transfer rate.
The PCI Express x 16 supports up to 4.0 GB/s transfer rate.
The PCI Express x 8 supports up to 2.0 GB/s transfer rate.
The PCI Express x 1 supports up to 250 MB/s transfer rate.



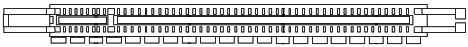
Mazarine PCI Express x16 Slots support
PCI Express 2.0x 16 speed (PCI_E1 & PCI_E4)



White PCI Express x 1 Slots support
PCI Express x 1 speed (PCI_E2 & PCI_E3)



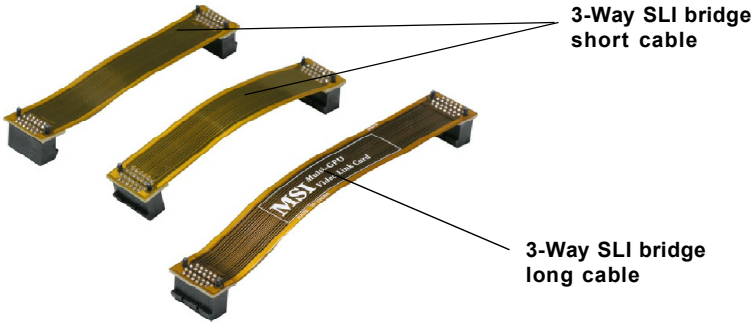
White PCI Express x 16 Slots support
PCI Express x 16 speed (PCI_E5)



Yellow PCI Express x 16 Slots support
PCI Express x 8 speed (PCI_E6)

NV 3-Way SLI Technology

NVIDIA 3-Way SLI (Scalable Link Interface) technology allows three GPUs to run in sequence within a system to achieve up to triple the performance of a single graphics card. To utilize this technology, the three GPU cards must be connected by 3-Way SLI bridge cables. Please refer to the following illustrations for enabling the 3-Way SLI technology.



Important

Before you configure the 3-SLI platform hardware, please make sure that:

1. *The three graphics cards have to support 3-Way SLI technology and they are of the same brand and specifications;*
2. *The 3-Way SLI platform requires specific **power supply requirement** which provide the **minimum 1000W** peak power to support the needs of three graphics cards in the system;*
3. *The 3-Way SLI platform also requires a **chassis** that meet the qualifictions for running 3-way NVIDIA SLI.*
4. *To visit the **nVIDIA official website** and find the GPUs, power supply and chassis that should be approved for 3-Way SLI.*

1. Installing three graphics cards which support 3-Way SLI technology on PCI Express x16 slots. After three cards installed, SLI Bridge cables are required to connect the golden fingers on the top of these three graphics cards (fig.1). Please note that although you have installed three graphics cards, only the video outputs on the first card (which be installed in PCI_E1 slot) will work. Hence, you only need to connect a monitor to the first PCI Express card.

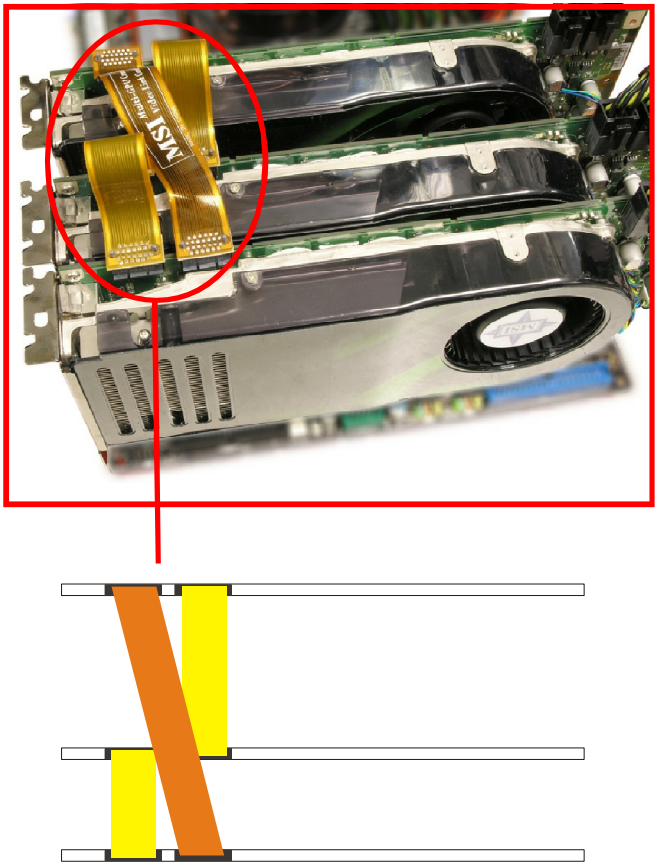


Fig.1 3-Way SLI Bridge cables connection

Important

1. *Mainboard photos shown in this section are for demonstration only. The appearance of your mainboard may vary depending on the model you purchase.*
2. *If you intend to install only **ONE** x16 graphics card, please install this graphics card in **mazarine** PCIE x16 (PCI_E1) slot to run full x16 speed.*
3. *If you wish to use 2-way SLI, you must install the two graphics cards in **mazarine** PCIE x16 slots (PCI_E1 & PCE_E4). Then, connect two graphics cards together using the 2 SLI bridge short cables (Fig.2). And remember to enable the SLI technology function as the following step 2 & step 3.*
4. *3-Way SLI technology supports Windows® **Vista** only.*

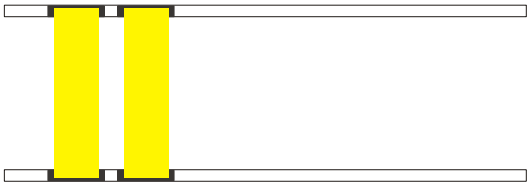
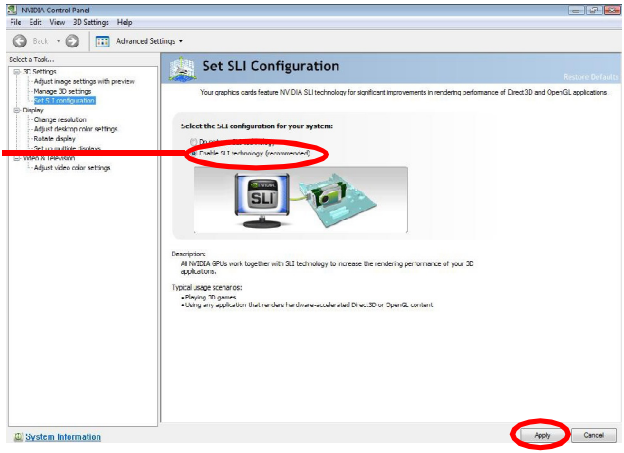


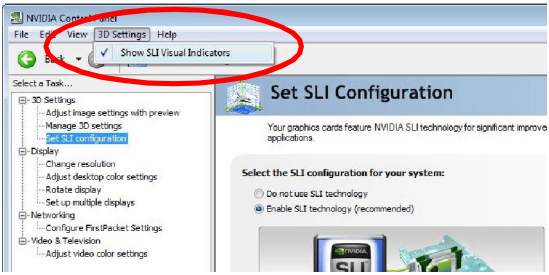
Fig.2 2-Way SLI Bridge cables connection

2. After the hardware installation is completed, power on the system and install the NVIDIA ForceWare Windows Vista driver. Reboot the system, a **NVIDIA Control Panel** will be provided for Multi-GPU control. Right click on windows desktop and select **NVIDIA Control Panel**. Go to 3D Settings --> Set SLI configuration and check **Enable SLI technology (recommended)**. Then press **Apply**. (concerning the details of multi-GPU settings, please refer to your graphics card manual).

Check the box



3. Go to 3D Settings on the top menu options, and check the **Show SLI Visual Indicators**. It will show the SLI x3 lable and a scaling bar in fullscreen 3D applications.

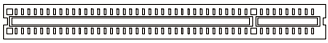


Important

If you want to quit the SLI function, make sure that you disable the "SLI technology" function.

PCI (Peripheral Component Interconnect) Slots

The PCI slots support LAN cards, SCSI cards, USB cards, and other add-on cards that comply with PCI specifications. At 32 bits and 33 MHz, it yields a throughput rate of 133 MBps.



Important

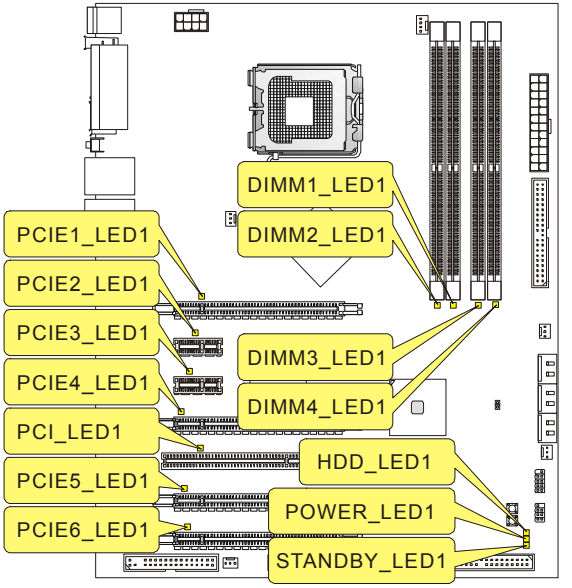
When adding or removing expansion cards, make sure that you unplug the power supply first. Meanwhile, read the documentation for the expansion card to configure any necessary hardware or software settings for the expansion card, such as jumpers, switches or BIOS configuration.

PCI Interrupt Request Routing

The IRQ, acronym of interrupt request line and pronounced I-R-Q, are hardware lines over which devices can send interrupt signals to the microprocessor. The PCI IRQ pins are typically connected to the PCI bus pins as follows:

	Order 1	Order 2	Order 3	Order 4
PCI Slot 1	INT A#	INT B#	INT C#	INT D#

LED Status Indicators



Name	Status
PCIE1_LED1	Lights when PCI_E1 slot is functional.
PCIE2_LED1	Lights when PCI_E2 slot is functional.
PCIE3_LED1	Lights when PCI_E3 slot is functional.
PCIE4_LED1	Lights when PCI_E4 slot is functional.
PCI_LED1	Lights when PCI1 slot is functional.
PCIE5_LED1	Lights when PCI_E5 slot is functional.
PCIE6_LED1	Lights when PCI_E6 slot is functional.
DIMM1_LED1	Lights when DIMM1 slot is functional.
DIMM2_LED1	Lights when DIMM2 slot is functional.
DIMM3_LED1	Lights when DIMM3 slot is functional.
DIMM4_LED1	Lights when DIMM4 slot is functional.
HDD_LED1	Lights when HDD is functional.
POWER_LED1	Lights when system is power-on.
STANDBY_LED1	Lights when system is in standby mode.

Chapter 3
BIOS Setup

This chapter provides information on the BIOS Setup program and allows you to configure the system for optimum use.
You may need to run the Setup program when:

- An error message appears on the screen during the system booting up, and requests you to run SETUP.
- You want to change the default settings for customized features.

MSI
MICRO-STAR INTERNATIONAL

Entering Setup

Power on the computer and the system will start POST (Power On Self Test) process. When the message below appears on the screen, press <DEL> key to enter Setup.

Press DEL to enter SETUP

If the message disappears before you respond and you still wish to enter Setup, restart the system by turning it OFF and On or pressing the RESET button. You may also restart the system by simultaneously pressing <Ctrl>, <Alt>, and <Delete> keys.

Important

1. *The items under each BIOS category described in this chapter are under continuous update for better system performance. Therefore, the description may be slightly different from the latest BIOS and should be held for reference only.*
2. *Upon boot-up, the 1st line appearing after the memory count is the BIOS version. It is usually in the format:*

   A7510NMS V1.0 121907 where:

   1st digit refers to BIOS maker as A = AMI, W = AWARD, and P = PHOENIX.
   2nd - 5th digit refers to the model number.
   6th digit refers to the chipset as I = Intel, N = nVidia, and V = VIA.
   7th - 8th digit refers to the customer as MS = all standard customers.
   V1.0 refers to the BIOS version.
   121907 refers to the date this BIOS was released.

Control Keys

<↑>	Move to the previous item
<↓>	Move to the next item
<←>	Move to the item in the left hand
<→>	Move to the item in the right hand
<Enter>	Select the item
<Esc>	Jumps to the Exit menu or returns to the main menu from a submenu
<+/PU>	Increase the numeric value or make changes
<-/PD>	Decrease the numeric value or make changes
<F6>	Load Optimized Defaults
<F7>	Load Fail-Safe Defaults
<F10>	Save all the CMOS changes and exit

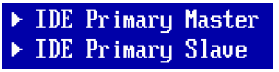
Getting Help

After entering the Setup menu, the first menu you will see is the Main Menu.

Main Menu

The main menu lists the setup functions you can make changes to. You can use the arrow keys (↑↓) to select the item. The on-line description of the highlighted setup function is displayed at the bottom of the screen.

Sub-Menu

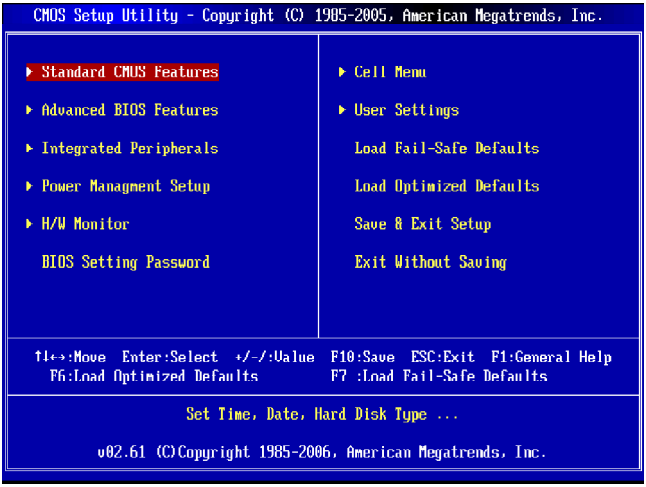


If you find a right pointer symbol (as shown in the right view) appears to the left of certain fields that means a sub-menu can be launched from this field. A sub-menu contains additional options for a field parameter. You can use arrow keys (↑↓) to highlight the field and press <Enter> to call up the sub-menu. Then you can use the control keys to enter values and move from field to field within a sub-menu. If you want to return to the main menu, just press the <Esc >.

General Help <F1>

The BIOS setup program provides a General Help screen. You can call up this screen from any menu by simply pressing <F1>. The Help screen lists the appropriate keys to use and the possible selections for the highlighted item. Press <Esc> to exit the Help screen.

The Main Menu


CMOS Setup Utility - Copyright (C) 1985-2005, American Megatrends, Inc.
Standard CMOS Features
Advanced BIOS Features
Integrated Peripherals
Power Management Setup
H/W Monitor
BIOS Setting Password
Cell Menu
User Settings
Load Fail-Safe Defaults
Load Optimized Defaults
Save & Exit Setup
Exit Without Saving
↑↓→←:Move Enter:Select +/-/:Value F10:Save ESC:Exit F1:General Help
F6:Load Optimized Defaults F7 :Load Fail-Safe Defaults
Set Time, Date, Hard Disk Type ...
v02.61 (C)Copyright 1985-2006, American Megatrends, Inc.

▶ Standard CMOS Features
Use this menu for basic system configurations, such as time, date etc.

▶ Advanced BIOS Features
Use this menu to setup the items of AMI® special enhanced features.

▶ Integrated Peripherals
Use this menu to specify your settings for integrated peripherals.

▶ Power Management Setup
Use this menu to specify your settings for power management.

▶ H/W Monitor
This entry shows your PC health status.

▶ BIOS Setting Password
Use this menu to set the password for BIOS.

▶ Cell Menu
Use this menu to specify your settings for frequency/voltage control and overclocking.

▶ User Settings
Use this menu to save or load settings.

▶ Load Fail-Safe Defaults
Use this menu to load the default values set by the BIOS vendor for stable system performance.

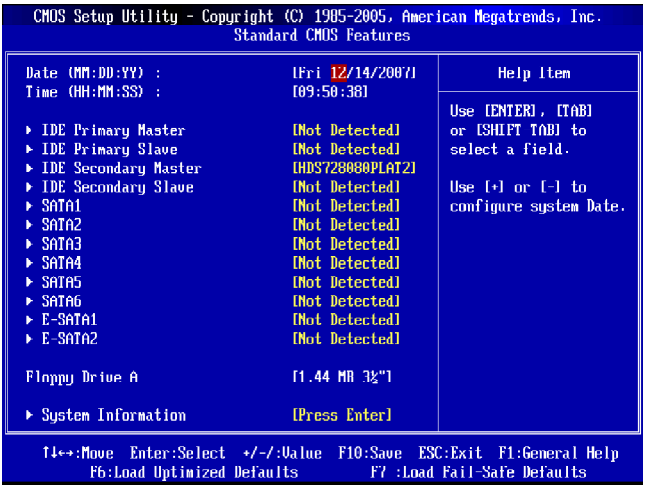
▶ Load Optimized Defaults
Use this menu to load the default values set by the mainboard manufacturer specifically for optimal performance of the mainboard.

▶ Save & Exit Setup
Save changes to CMOS and exit setup.

▶ Exit Without Saving
Abandon all changes and exit setup.

Standard CMOS Features

The items in Standard CMOS Features Menu includes some basic setup items. Use the arrow keys to highlight the item and then use the <PgUp> or <PgDn> keys to select the value you want in each item.


CMOS Setup Utility - Copyright (C) 1985-2005, American Megatrends, Inc.
Standard CMOS Features
Date (MM:DD:YY) : [Fri 12/14/2007]
Time (HH:MM:SS) : [09:50:38]
IDE Primary Master [Not Detected]
IDE Primary Slave [Not Detected]
IDE Secondary Master [HDS728080PLAT2]
IDE Secondary Slave [Not Detected]
SATA1 [Not Detected]
SATA2 [Not Detected]
SATA3 [Not Detected]
SATA4 [Not Detected]
SATA5 [Not Detected]
SATA6 [Not Detected]
E-SATA1 [Not Detected]
E-SATA2 [Not Detected]
Floppy Drive A [1.44 MB 3½"]
System Information [Press Enter]
Help Item
Use [ENTER], [TAB] or [SHIFT TAB] to select a field.
Use [+] or [-] to configure system Date.
↑↓↔:Move Enter:Select +/-/:Value F10:Save ESC:Exit F1:General Help
F6:Load Optimized Defaults F7 :Load Fail-Safe Defaults

▶ Date (MM:DD:YY)

This allows you to set the system to the date that you want (usually the current date). The format is <day><month> <date> <year>.

day	Day of the week, from Sun to Sat, determined by BIOS. Read-only.
month	The month from Jan. through Dec.
date	The date from 1 to 31 can be keyed by numeric function keys.
year	The year can be adjusted by users.

▶ Time (HH:MM:SS)

This allows you to set the system time that you want (usually the current time). The time format is <hour> <minute> <second>.

▶ Primary/Secondary Master/ Slave & Serial-ATA 1~6 Channel & E-SATA1/2

Press <Enter> to enter the sub-menu, and the following screen appears.

▶ Device/ Vender/ Size

It will showing the device information that you connected to the IDE / SATA / E-SATA connectors.

▶ LBA/Large Mode
This allows you to enable or disable the LBA Mode. Setting to Auto enables LBA mode if the device supports it and the devices is not already formatted with LBA mode disabled.

▶ DMA Mode
Select DMA Mode.

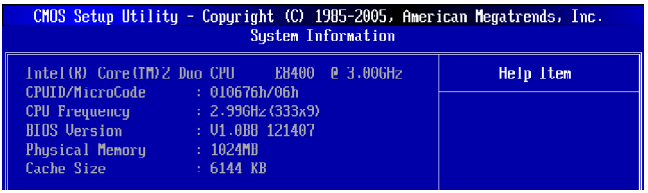
▶ Hard Disk S.M.A.R.T.
This allows you to activate the S.M.A.R.T. (Self-Monitoring Analysis & Reporting Technology) capability for the hard disks. S.M.A.R.T. is a utility that monitors your disk status to predict hard disk failure. This gives you an opportunity to move data from a hard disk that is going to fail to a safe place before the hard disk becomes offline.

Important

IDE Primary/Secondary Master/Slave, SATA1~6 & E-SATA1/2 *are appearing when you connect the HD devices to the SATA connector on the mainboard.*

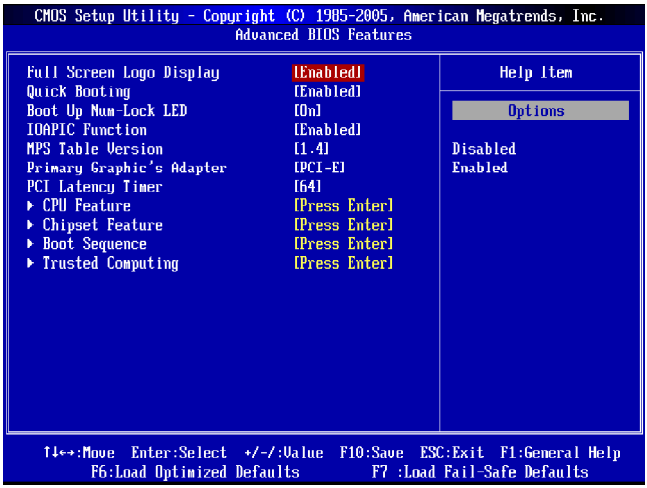
▶ Floppy Drive A
This item allows you to set the type of floppy drives installed. Available options: [None], [360K, 5.25 in.], [1.2M, 5.25 in.], [720K, 3.5 in.], [1.44M, 3.5 in.], [2.88M, 3.5 in.].

▶ System Information
Press <Enter> to enter the sub-menu, and the following screen appears.


CMOS Setup Utility - Copyright (C) 1985-2005, American Megatrends, Inc.
System Information
Intel(R) Core(TM)2 Duo CPU E8400 @ 3.00GHz
CPUID/MicroCode : 010676h/06h
CPU Frequency : 2.99GHz(333x9)
BIOS Version : V1.0B0 121407
Physical Memory : 1024MB
Cache Size : 6144 KB
Help Item

This sub-menu shows the CPU information, BIOS version and memory status of your system (read only).

Advanced BIOS Features


CMOS Setup Utility - Copyright (C) 1985-2005, American Megatrends, Inc.
Advanced BIOS Features
Full Screen Logo Display [Enabled]
Quick Booting [Enabled]
Boot Up Num-Lock LED [On]
IOAPIC Function [Enabled]
MPS Table Version [1.4]
Primary Graphic's Adapter [PCI-E]
PCI Latency Timer [64]
CPU Feature [Press Enter]
Chipset Feature [Press Enter]
Boot Sequence [Press Enter]
Trusted Computing [Press Enter]
Help Item
Options
Disabled
Enabled
↑↓←→:Move Enter:Select +/-/:Value F10:Save ESC:Exit F1:General Help
F6:Load Optimized Defaults F7 :Load Fail-Safe Defaults

► Full Screen Logo Display

This item enables you to show the company logo on the bootup screen. Settings are:

[Enabled] Shows a still image (logo) on the full screen at boot.

[Disabled] Shows the POST messages at boot.

► Quick Booting

Setting the item to [Enabled] allows the system to boot within 10 seconds since it will skip some check items.

► Boot Up Num-Lock LED

This setting is to set the Num Lock status when the system is powered on. Setting to [On] will turn on the Num Lock key when the system is powered on. Setting to [Off] will allow users to use the arrow keys on the numeric keypad.

► IOAPIC Function

This field is used to enable or disable the APIC (Advanced Programmable Interrupt Controller). Due to compliance with PC2001 design guide, the system is able to run in APIC mode. Enabling APIC mode will expand available IRQ resources for the system.

► MPS Table Version

This field allows you to select which MPS (Multi-Processor Specification) version to be used for the operating system. You need to select the MPS version supported by your operating system. To find out which version to use, consult the vendor of your operating system.

▶ Primary Graphics Adapter
This setting specifies which graphic card is your primary graphics adapter.

▶ PCI Latency Timer
This item controls how long each PCI device can hold the bus before another takes over. When set to higher values, every PCI device can conduct transactions for a longer time and thus improve the effective PCI bandwidth. For better PCI performance, you should set the item to higher values.

▶ CPU Feature
Press <Enter> to enter the sub-menu and the following screen appears:

CMOS Setup Utility - Copyright (C) 1985-2005, American Megatrends, Inc.
CPU Feature
Execute Bit Support [Disabled]
Set Limit CPUID MaxVal to 3 [Disabled]
Help Item

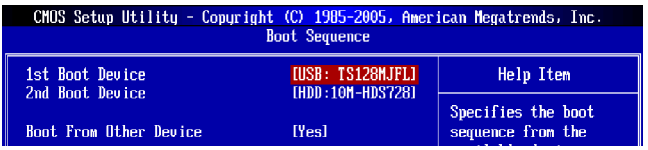
▶ Execute Bit Support
Intel's Execute Disable Bit functionality can prevent certain classes of malicious "buffer overflow" attacks when combined with a supporting operating system. This functionality allows the processor to classify areas in memory by where application code can execute and where it cannot. When a malicious worm attempts to insert code in the buffer, the processor disables code execution, preventing damage or worm propagation.

▶ Set Limit CPUID MaxVal to 3
The Max CPUID Value Limit is designed to limit the listed speed of the processor to older operating systems.

▶ Chipset Feature
Press <Enter> to enter the sub-menu and the following screen appears:

▶ HPET
The HPET (High Precision Event Timers) is a component that is part of the chipset. You can to enable it, and will provide you with the means to get to it via the various ACPI methods.

▶ Boot Sequence
Press <Enter> to enter the sub-menu and the following screen appears:


CMOS Setup Utility - Copyright (C) 1985-2005, American Megatrends, Inc.
Boot Sequence
1st Boot Device [USB: TS128MJFL]
2nd Boot Device [HDD:10M-HDS728]
Boot From Other Device [Yes]
Help Item
Specifies the boot sequence from the

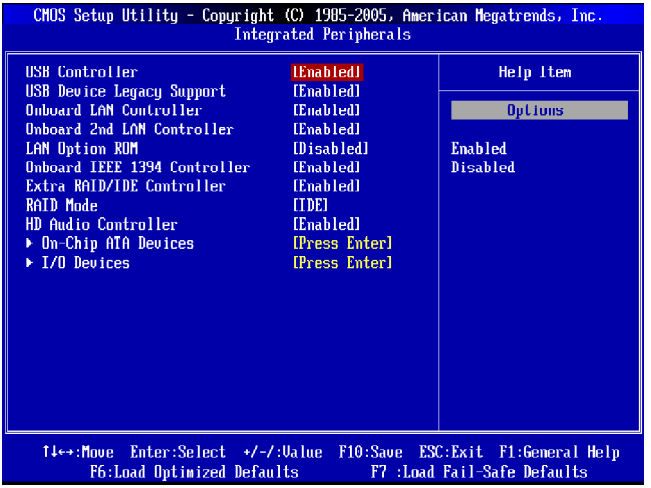
▶ **1st/ 2nd Boot Device**
The items allow you to set the first/ second boot device where BIOS attempts to load the disk operating system.

▶ **Boot From Other Device**
Setting the option to [Yes] allows the system to try to boot from other device. if the system fails to boot from the 1st/ 2nd/ 3rd boot device.

▶ **Trusted Computing**
Press <Enter> to enter the sub-menu and the following screen appears

▶ **TCG/TPM SUPPORT**
This setting allows you to enable/disable the TCG/TPM.

Integrated Peripherals


CMOS Setup Utility - Copyright (C) 1985-2005, American Megatrends, Inc.
Integrated Peripherals
USB Controller [Enabled]
USB Device Legacy Support [Enabled]
Onboard LAN Controller [Enabled]
Onboard 2nd LAN Controller [Enabled]
LAN Option ROM [Disabled]
Onboard IEEE 1394 Controller [Enabled]
Extra RAID/IDE Controller [Enabled]
RAID Mode [IDE]
HD Audio Controller [Enabled]
▸ On-Chip ATA Devices [Press Enter]
▸ I/O Devices [Press Enter]
Help Item
Options
Enabled
Disabled
↑↓↔:Move Enter:Select +/-/:Value F10:Save ESC:Exit F1:General Help
F6:Load Optimized Defaults F7 :Load Fail-Safe Defaults

▶ USB Controller
This setting allows you to enable/disable the onboard USB controller.

▶ USB Device Legacy Support
Select [Enabled] if you need to use a USB-interfaced device in the operating system.

▶ Onboard LAN Controller
This item is used to enable/disable the onboard LAN controller.

▶ Onboard 2nd LAN Controller
This item is used to enable/disable the onboard 2nd LAN controller.

▶ LAN Option ROM
This item is used to decide whether to invoke the Boot ROM of the LAN controller.

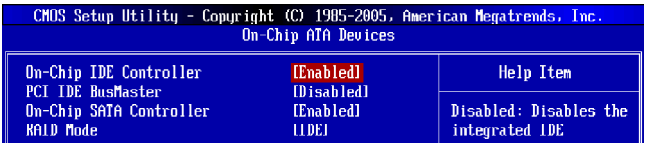
▶ Onboard IEEE1394 Controller
This item allows you to enable/disable the onboard IEEE1394 controller.

▶ Extra RAID/IDE Controller
This item allows you to enable/disable the extra RAID/IDE JMB363 controller(IDE2, E-SATA1 and E-SATA2).

▶ RAID Mode
This item allows you to enable/ disable the RAID function. Select [RAID] will enable RAID.

▶ HD Audio Controller
This setting is used to enable/disable the onboard audio controller.

▶ On-Chip ATA Devices
Press <Enter> to enter the sub-menu and the following screen appears:



▶ On-Chip IDE Controller
This item allows you to enable/ disable the IDE controller.

▶ PCI IDE BusMaster
This item allows you to enable/ disable BIOS to used PCI busmastering for reading/ writing to IDE drives.

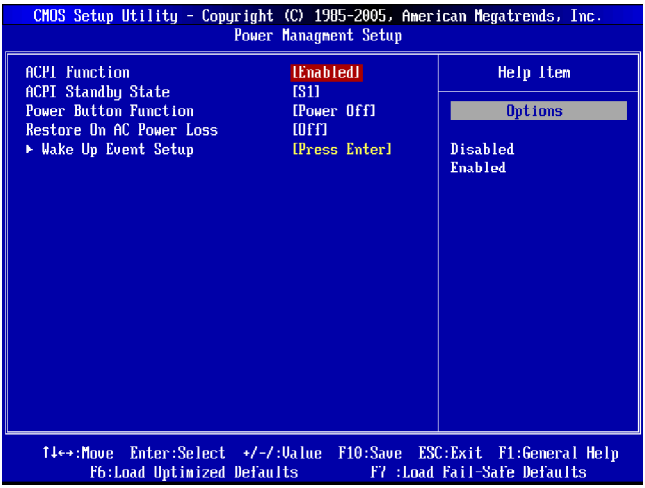
▶ On-Chip SATA Controller
This item allows you to enable/ disable the SATA controller.

▶ RAID Mode
This item allows you to enable/ disable the RAID function. Select [RAID] will enable RAID.

▶ I/O Devices
Press <Enter> to enter the sub-menu and the following screen appears:

▶ COM Port 1
Select an address and corresponding interrupt for the first serial port.

Power Management Setup


CMOS Setup Utility - Copyright (C) 1985-2005, American Megatrends, Inc.
Power Managment Setup
ACPI Function [Enabled]
ACPI Standby State [S1]
Power Button Function [Power Off]
Restore On AC Power Loss [Off]
▸ Wake Up Event Setup [Press Enter]
Help Item
Options
Disabled
Enabled
↑↓↔:Move Enter:Select +/-/:Value F10:Save ESC:Exit F1:General Help
F6:Load Uptimized Defaults F7 :Load Fail-Safe Defaults

Important

S3-related functions described in this section are available only when your BIOS supports S3 sleep mode.

▶ ACPI Function

This item is to activate the ACPI (Advanced Configuration and Power Management Interface) Function. If your operating system is ACPI-aware, such as Windows 2000/ XP, select [Enabled].

▶ ACPI Standby State

This item specifies the power saving modes for ACPI function. If your operating system supports ACPI, such as Windows 2000/ XP , you can choose to enter the Standby mode in S1(POS) or S3(STR) fashion through the setting of this field. Settings are:

[S1] The S1 sleep mode is a low power state. In this state, no system context is lost (CPU or chipset) and hardware maintains all system context.

[S3] The S3 sleep mode is a lower power state where the information of system configuration and open applications/files is saved to main memory that remains powered while most other hardware components turn off to save energy. The information stored in memory will be used to restore the system when a “wake up” event occurs.

▶ Power Button Function
This feature sets the function of the power button. Settings are:

[Power Off]	The power button functions as normal power off button.
[Suspend]	When you press the power button, the computer enters the suspend/sleep mode, but if the button is pressed for more than four seconds, the computer is turned off.

▶ Restore On AC Power Loss
This item specifies whether your system will reboot after a power failure or interrupt occurs. Settings are:

[Off]	Always leaves the computer in the power off state.
[On]	Always leaves the computer in the power on state.
[Last State]	Restores the system to the status before power failure or interrupt occurred.

▶ Wake Up Event Setup
Press <Enter> and the following sub-menu appears.

CMOS Setup Utility - Copyright (C) 1985-2005, American Megatrends, Inc.
Wake Up Event Setup
Resume From S3 By USB Device [Disabled]
Resume From S3 By PS/2 Keyboard [Hot Key]
Hot Key [Ctrl+Esc]
Resume From S3 By PS/2 Mouse [Disabled]
Resume By PCI Device (PME#) [Enabled]
Resume By PCI-E Device [Enabled]
Resume By Onboard LAN [Enabled]
Resume By RTC Alarm [Disabled]
Help Item
Options
Disabled
Hot Key
Any Key

▶ Resume From S3 By USB Device
The item allows the activity of the USB device to wake up the system from S3 (Suspend to RAM) sleep state.

▶ Resume From S3 By PS/2 Keyboard
This setting determines whether the system will be awakened from what power saving modes when input signal of the PS/2 keyboard is detected.

▶ Hot Key
When **Resume From S3 By PS / 2 Keyboard** set to **Hot Key**, this setting allows you to select the hot key combination.

▶ Resume From S3 By PS/2 Mouse
This setting determines whether the system will be awakened from what power saving modes when input signal of the PS/2 mouse is detected.

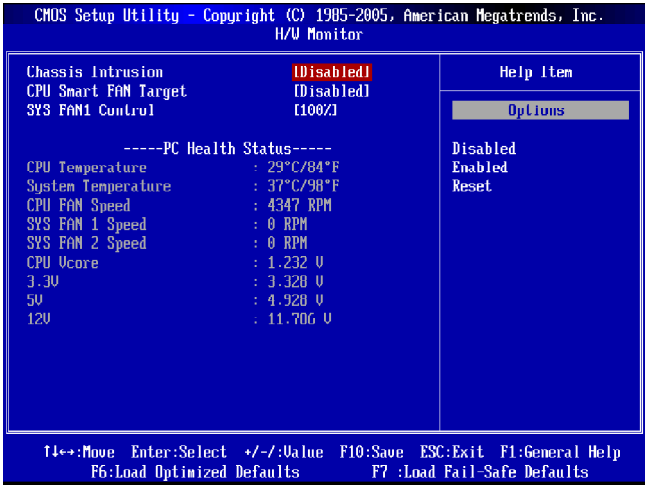
▶ Resume By PCI Device (PME#)
When set to [Enabled], the feature allows your system to be awakened from the power saving modes through any event on PME (Power Management Event).

► Resume by PCI-E Device
When set to [Enabled], the feature allows your system to be awakened from the power saving modes through any event on PCI Express device.

► Resume by Onbaord LAN
When set to [Enabled], the feature allows your system to be awakened from the power saving modes through any event on LAN device.

► Resume by RTC Alarm
The field is used to enable or disable the feature of booting up the system on a scheduled time/date.

H/W Monitor


CMOS Setup Utility - Copyright (C) 1985-2005, American Megatrends, Inc.
H/W Monitor
Chassis Intrusion [Disabled]
CPU Smart FAN Target [Disabled]
SYS FAN1 Control [100%]
-----PC Health Status-----
CPU Temperature : 29°C/84°F
System Temperature : 37°C/98°F
CPU FAN Speed : 4347 RPM
SYS FAN 1 Speed : 0 RPM
SYS FAN 2 Speed : 0 RPM
CPU Vcore : 1.232 V
3.3V : 3.328 V
5V : 4.928 V
12V : 11.706 V
Help Item
Options
Disabled
Enabled
Reset
↑↓↔:Move Enter:Select +/-/:Value F10:Save ESC:Exit F1:General Help
F6:Load Optimized Defaults F7 :Load Fail-Safe Defaults

▶ Chassis Intrusion
The field enables or disables the feature of recording the chassis intrusion status and issuing a warning message if the chassis is once opened. To clear the warning message, set the field to [Reset]. The setting of the field will automatically return to [Enabled] later.

▶ CPU Smart FAN Target
The mainboard provides the Smart Fan function which can control the CPU fan speed automatically depending on the current temperature to keep it with in a specific range. You can select a fan target value here. If the current CPU fan temperature reaches to the target value, the smart fan function will be activated. It provides several sections to speed up for cooling down automaticlly.

▶ CPU Fan Tolerance Value
When a particular temperature setting is selected for the previous item, **CPU Smart Fan Target**, a temperature tolerance value between 1 to 5 can be adjusted here.

▶ SYS FAN1 / 2 Control (SYS FAN2 is for NBFAN1)
This item is used to specify the percentage of SYSFAN1/ 2 speed.

---- PC Health Status ----

▶ CPU/ System Temperature, CPU FAN/ SYS FAN1/ SYS FAN2 Speed, CPU Vcore, 3.3V, 5V, 12V, 5VSB
These items display the current status of all of the monitored hardware devices/ components such as CPU voltage, temperatures and all fans' speeds.

BIOS Setting Password

When you select this function, a message as below will appear on the screen:

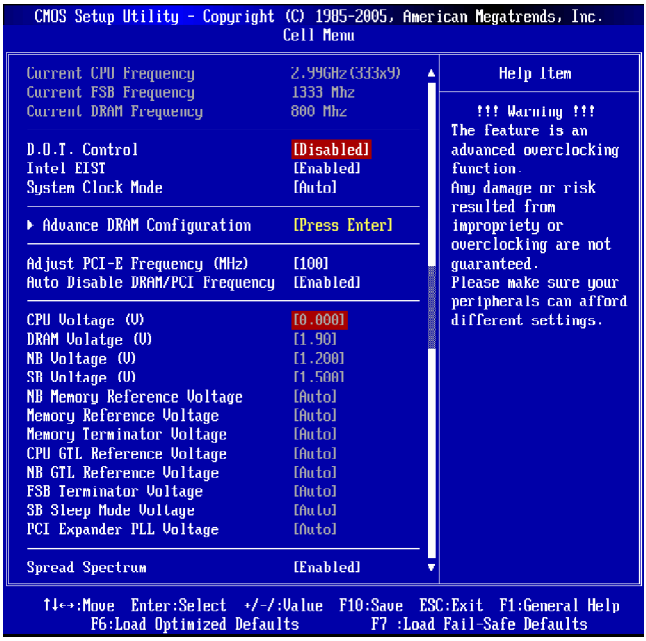
Type the password, up to six characters in length, and press <Enter>. The password typed now will replace any previously set password from CMOS memory. You will be prompted to confirm the password. Retype the password and press <Enter>. You may also press <Esc> to abort the selection and not enter a password.

To clear a set password, just press <Enter> when you are prompted to enter the password. A message will show up confirming the password will be disabled. Once the password is disabled, the system will boot and you can enter Setup without entering any password.

When a password has been set, you will be prompted to enter it every time you try to enter Setup. This prevents an unauthorized person from changing any part of your system configuration.

After setting in the **Password Advance BIOS Features** menu the **Password Check** option is available.

Cell Menu


CMOS Setup Utility - Copyright (C) 1985-2005, American Megatrends, Inc.
Cell Menu
Current CPU Frequency 2.99GHz(333x9)
Current FSB Frequency 1333 Mhz
Current DRAM Frequency 800 Mhz
D.O.T. Control [Disabled]
Intel EIST [Enabled]
System Clock Mode [Auto]
Advance DRAM Configuration [Press Enter]
Adjust PCI-E Frequency (MHz) [100]
Auto Disable DRAM/PCI Frequency [Enabled]
CPU Voltage (V) [0.000]
DRAM Volatge (V) [1.90]
NB Voltage (V) [1.200]
SB Voltage (V) [1.500]
NB Memory Reference Voltage [Auto]
Memory Reference Voltage [Auto]
Memory Terminator Voltage [Auto]
CPU GTL Reference Voltage [Auto]
NB GTL Reference Voltage [Auto]
FSB Terminator Voltage [Auto]
SB Sleep Mode Voltage [Auto]
PCI Expander PLL Voltage [Auto]
Spread Spectrum [Enabled]
Help Item
!!! Warning !!!
The feature is an advanced overclocking function.
Any damage or risk resulted from impropriety or overclocking are not guaranteed.
Please make sure your peripherals can afford different settings.
↑↓↔:Move Enter:Select +/-/:Value F10:Save ESC:Exit F1:General Help
F6:Load Optimized Defaults F7 :Load Fail-Safe Defaults

Important

Change these settings only if you are familiar with the chipset.

► Current CPU/ FSB/ DRAM Frequency

These items show the current clocks of CPU and Memory speed. Read-only.

► D.O.T Control

D.O.T. (Dynamic Overclocking Technology) is the automatic overclocking function, included in the MSI™'s newly developed CoreCell™ Technology. It is designed to detect the load balance of CPU while running programs, and to adjust the best CPU frequency automatically. When the motherboard detects CPU is running programs, it will speed up CPU automatically to make the program run smoothly and faster. When the CPU is temporarily suspending or staying in the low load balance, it will restore the default settings instead. Usually the Dynamic Overclocking Technology will be powered only when users' PC need to run huge amount of data like 3D games or the video process, and the CPU frequency need to be boosted up to enhance the overall performance. Settings are:

[Disabled]	Disable Dynamic Overclocking.
[Private]	1st level of overclocking, increasing the frequency by 1%.
[Sergeant]	2nd level of overclocking, increasing the frequency by 3%.
[Captain]	3rd level of overclocking, increasing the frequency by 5%.
[Colonel]	4th level of overclocking, increasing the frequency by 7%.
[General]	5th level of overclocking, increasing the frequency by 10%.
[Commander]	6th level of overclocking, increasing the frequency by 15%.

Important

Even though the Dynamic Overclocking Technology is more stable than manual overclocking, basically, it is still risky. We suggest user to make sure that your CPU can afford to overclocking regularly first. If you find the PC appears to be unstable or reboot incidentally, it's better to disable the Dynamic Overclocking or to lower the level of overclocking options. By the way, if you need to conduct overclocking manually, you also need to disable the Dynamic OverClocking first.

▶ Intel EIST

The Enhanced Intel SpeedStep technology allows you to set the performance level of the microprocessor whether the computer is running on battery or AC power. This field will appear after you installed the CPU which support speedstep technology.

▶ System Clock Mode

This item is used to switch the following two items.

▶ FSB Clock (MHz)

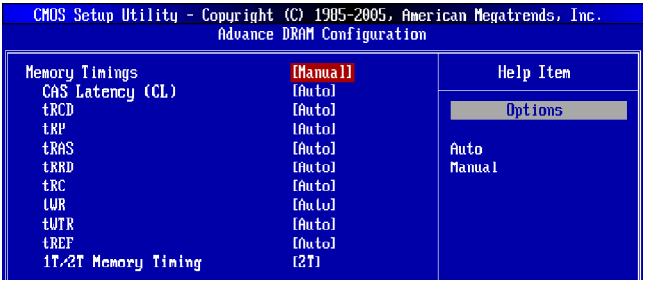
When the **System Clock Mode** sets to [Auto], the field is adjustable. This item allows you to select the CPU Front Side Bus clock frequency (in MHz).

▶ Memory Clock (MHz)

When the **System Clock Mode** sets to [Auto], the field is adjustable.This item allows you to select the memory clock frequency (in MHz).

▶ Advance DRAM Configuration

Press <Enter> to enter the sub-menu and the following screen appears.



▶ Memory Timings
Selects whether DRAM timing is controlled by the SPD (Serial Presence Detect) EEPROM on the DRAM module. Setting to [Auto By SPD] enables DRAM timings and the following related items to be determined by BIOS based on the configurations on the SPD. Selecting [Manual] allows users to configure the DRAM timings and the following related items manually.

▶ CAS Latency (CL)
When the **Memory Timings** sets to [Manual], the field is adjustable.This controls the CAS latency, which determines the timing delay (in clock cycles) before SDRAM starts a read command after receiving it.

▶ tRCD
When the **Memory Timings** sets to [Manual], the field is adjustable. When DRAM is refreshed, both rows and columns are addressed separately. This setup item allows you to determine the timing of the transition from RAS (row address strobe) to CAS (column address strobe). The less the clock cycles, the faster the DRAM performance.

▶ tRP
When the **Memory Timings** sets to [Manual], the field is adjustable. This item controls the number of cycles for Row Address Strobe (RAS) to be allowed to precharge. If insufficient time is allowed for the RAS to accumulate its charge before DRAM refresh, refreshing may be incomplete and DRAM may fail to retain data. This item applies only when synchronous DRAM is installed in the system.

▶ tRAS
When the **Memory Timings** sets to [Manual], the field is adjustable. This setting determines the time RAS takes to read from and write to a memory cell.

▶ tRRD
When the **Memory Timings** sets to [Manual], the field is adjustable. Specifies the active-to-active delay of different banks.

▶ tRC
When the **Memory Timings** sets to [Manual], the field is adjustable. The row cycle time determines the minimum number of clock cycles a memory row takes to complete a full cycle, from row activation up to the precharging of the active row.

▶ tWR
When the **Memory Timings** is set to [Manual], the field is adjustable. It specifies the amount of delay (in clock cycles) that must elapse after the completion of a valid write operation, before an active bank can be precharged. This delay is required to guarantee that data in the write buffers can be written to the memory cells before precharge occurs.

▶ **tWTR**
When the **Memory Timings** is set to [Manual], the field is adjustable. This item controls the Write Data In to Read Command Delay memory timing. This constitutes the minimum number of clock cycles that must occur between the last valid write operation and the next read command to the same internal bank of the DDR device.

▶ **tREF**
When the **Memory Timings** is set to [Manual], the field is adjustable. Specifies the refresh rate of the DIMM requiring the most frequent refresh.

▶ **1T/2T Memory Timing**
When the **Memory Timings** is set to [Manual], the field is adjustable. This field controls the SDRAM command rate. Selecting [1T] makes SDRAM signal controller to run at 1T (T=clock cycles) rate. Selecting [2T] makes SDRAM signal controller run at 2T rate.

▶ **Adjust PCI-E Frequency**
This field allows you to select the PCIE frequency (in MHz).

▶ **Auto Disabled DRAM/PCI Frequency**
When set to [Enabled], the system will remove (turn off) clocks from empty DIMM and PCI slots to minimize the electromagnetic interference (EMI).

▶ **CPU Voltage (V)**
This item allows you to increase the CPU voltage.

▶ **DRAM Voltage (V)**
Adjusting the voltage can increase the memory speed.

▶ **NB Voltage (V)**
Adjust the North Bridge chipset voltage.

▶ **SB Voltage (V)**
Adjust the South Bridge voltage.

▶ **NB Memory Reference Voltage**
This item allows you to set the NB Memory Reference voltage.

▶ **Memory Reference Voltage**
This item allows you to set the Memory Reference voltage.

▶ **Memory Terminator Voltage**
This item allows you to set the Memory Terminator voltage.

▶ **CPU GTL Reference Voltage**
This item allows you to set the CPU GTL Reference voltage.

► NB GTL Reference Voltage
This item allows you to set the NB GTL Reference voltage.

► FSB Terminator Voltage
This item allows you to set the FSB Terminator voltage.

► NB Memory Reference Voltage
This item allows you to set the NB Memory Reference voltag

► SB Sleep Mode Voltage
This item allows you to set the SB Sleep Mode voltage.

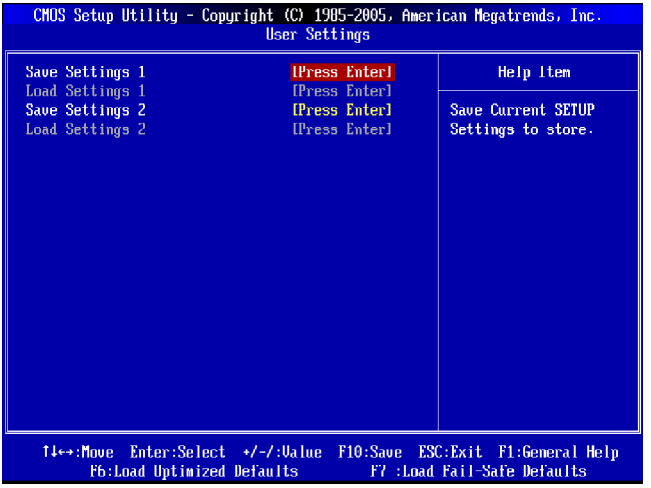
► PCIe Expander PLL Voltage
This item allows you to set the PCI Expander PLL voltage.

► Spread Spectrum
This setting is used to enable or disable the Spread Spectrum feature. When overclocking, always set it to [Disabled].

Important

1. *If you do not have any EMI problem, leave the setting at [Disabled] for optimal system stability and performance. But if you are plagued by EMI, select the value of Spread Spectrum for EMI reduction.*
2. *The greater the Spread Spectrum value is, the greater the EMI is reduced, and the system will become less stable. For the most suitable Spread Spectrum value, please consult your local EMI regulation.*
3. *Remember to disable Spread Spectrum if you are overclocking because even a slight jitter can introduce a temporary boost in clock speed which may just cause your overclocked processor to lock up.*

User Settings


CMOS Setup Utility - Copyright (C) 1985-2005, American Megatrends, Inc.
User Settings
Save Settings 1 [Press Enter]
Load Settings 1 [Press Enter]
Save Settings 2 [Press Enter]
Load Settings 2 [Press Enter]
Help Item
Save Current SETUP Settings to store.
↑↓↔:Move Enter:Select +/-/:Value F10:Save ESC:Exit F1:General Help
F6:Load Optimized Defaults F7 :Load Fail-Safe Defaults

▶ Save Settings 1/2
Select this item and press “Enter” to save any changes you have made to your current settings.

▶ Load Settings 1/2
Select this item and press “Enter” to load settings from the store.

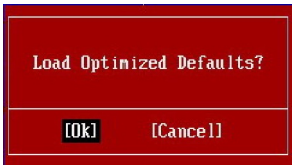
Load Fail-Safe/ Optimized Defaults

The two options on the main menu allow users to restore all of the BIOS settings to the default Fail-Safe or Optimized values. The Optimized Defaults are the default values set by the mainboard manufacturer specifically for optimal performance of the mainboard. The Fail-Safe Defaults are the default values set by the BIOS vendor for stable system performance.

When you select Load Fail-Safe Defaults, a message as below appears:

Selecting ***Ok*** and pressing ***Enter*** loads the BIOS default values for the most stable, minimal system performance.

When you select Load Optimized Defaults, a message as below appears:



Selecting ***Ok*** and pressing ***Enter*** loads the default factory settings for optimal system performance.

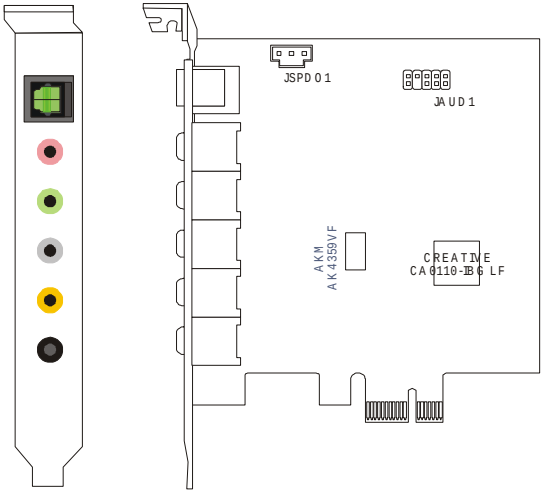
Appendix A
X-Fi Xtreme Audio Card

The X-Fi Xtreme Audio card is powered by Creative CA0110 Audio chip. It supports up to 8-channel & SPDIF audio effect and allows users to attach 2, 4, 6, or 8 speakers for better surround sound effect. This manual will tell you about the specifications of the card, how to install it to a mainboard, how to connect 2, 4, 6, or 8 speakers to it, and to operate 2-, 4-, 6-, or 8-channel audio function.

MSI
MICRO-STAR INTERNATIONAL

Introduction

X-Fi Xtreme Audio Card is powered by Creative CA0110 Digital Audio Controller. This card provides advanced audio functions by offering a comprehensive suite of software applications. The advanced tools and amazing features provided will allow you to experience a full array of exciting activities, such as listening to effects enhanced music, watching a multi-channel movie, playing the latest game or recording a high quality audio track.



Features

High Definition Audio Quality

- 144-pin LQFP ASIC with 64 audio channel playback at independent sample rates
- 24-bit Analog-to-Digital conversion of analog inputs at 96kHz sample rate
- 24-bit Digital-to-Analog conversion of digital sources at 96kHz to analog 7.1 speaker output
- 16-bit and 24-bit recording with sampling rates of 8, 11.025, 16, 22.05, 24, 32, 44.1, 48 and 96kHz
- SPDIF output up to 24-bit resolution at selectable sampling rate of 44.1, 48 or 96kHz

EAX® ADVANCED HD™ Audio Technology

- User-selectable EAX ADVANCED HD MUSIC presets, pre-configurable modes simulating various acoustic environments
- Optimized settings for headphones, stereo, 4.1, 5.1, 6.1 or 7.1 speakers
- Creative Multi-Speaker Surround™ (CMSS®) technology transforms all stereo audio into 7.1 multi-channel playback

Realistic Wave-Table Synthesis
- 64-Voice polyphony and multi-timbral capability
- 128 GM & GS compatible instruments and 10 drum kits
- 2MB or 4MB GM SoundFont Bank included

Sound Blaster Live! 24-bit Input/Output
- Line level out (Front/ Side/ Rear/ Centre/ Subwoofer) or Headphone out
- Line In / Microphone In
- S/PDIF In and S/PDIF Out
- Auxiliary Audio in

Works with the Following Standards
- Windows® XP SP2 and Vista
- Sound Blaster MIDI and General MIDI
- Microsoft® DirectSound®, DirectSound 3D & derivatives
- Plug and Play
- Sound Blaster PCI
- EAX® ADVANCED HD™
- EAX
- PCI 2.3 compliant
- AC97 compliant

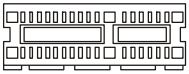
Sound Blaster Live! 24-bit Audio Performance
- Signal-to-Noise Ratio (A-Weighted) = 100 dB (2V)
- Frequency Response at -3 dBr = <10 Hz to 40 kHz

Hardware Installation

Installing the Card

The interface of X-Fi Xtreme Audio Card is PCI-E x1. You can install it to the PCI-E slot. Follow the steps below to install the card, then you can activate the advanced function and enjoy the audio effect.

1. Turn off your computer and disconnect the power cord.
2. Open and remove the case of the computer.
3. Find an empty PCI-E x1 slot. Or you can also install it to PCI-E x4, or x16 slot, only the speed remains x1.

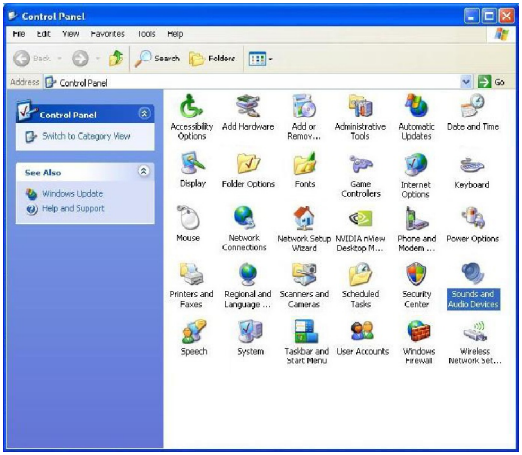


4. Remove the bracket which may obstruct the PCI-E x1 slot.
5. Gently but firmly install the X-Fi Xtreme Audio Card to the PCI-E slot and secure the card bracket with a screw.
6. Replace and secure the case. Reconnect the power cord to the computer.

Select Audio Controller

If your mainboard integrates audio function or an audio card installed, after installing the X-Fi Xtreme Audio Card and its driver, there will be two audio controllers available on your system. Either one can be selected and used at a time. Please follow the steps below to select and operate.

1. Go to **Control Panel**, double click on the **Sound and Audio Devices**.
2. Select **Sound Blaster X-Fi Xtreme Audio** in the **Default Device** drop-down menus of **Audio** and **Voice** tags.
3. Click OK button to save settings and close the window.



4. If you need to use the function of another audio controller, select the corresponding option.

Connecting the Speakers

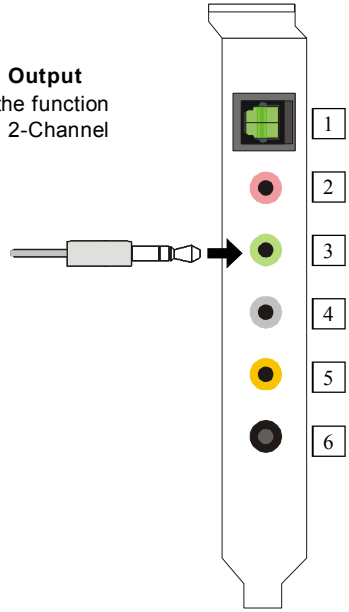
When you have set the Multi-Channel Audio Function mode properly in the software utility, connect your speakers to the correct jacks in accordance with the setting in software utility.

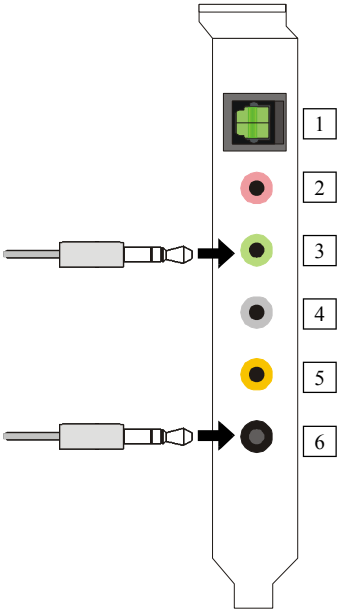
n 2-Channel Mode for 2-Speaker Output

Refer to the diagram and caption for the function of each jack on the back panel when 2-Channel Mode is selected.

2-Channel Analog Audio Output

1. S/PDIF Out-Optical
2. MIC & Line-In
3. Line Out *(Front channels)*
4. No function
5. No function
6. No function





n 4-Channel Mode for 4-Speaker Output

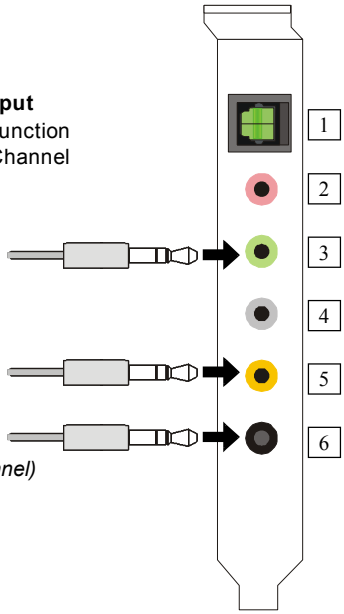
Refer to the diagram and caption for the function of each jack on the back panel when 4-Channel Mode is selected.

4-Channel Analog Audio Output

1. S/PDIF Out-Optical
2. MIC & Line-In
3. Line Out *(Front channels)*
4. No function
5. No function
6. Line Out *(Rear channels)*

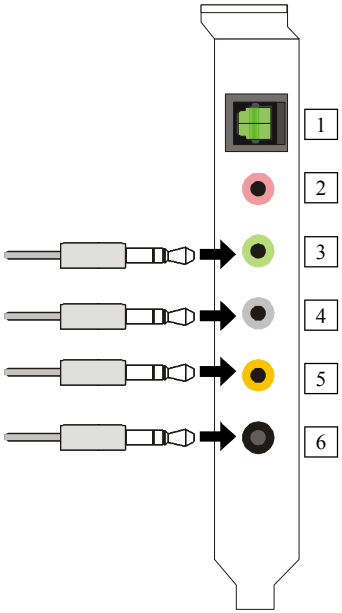
n 6-Channel Mode for 6-Speaker Output

Refer to the diagram and caption for the function of each jack on the back panel when 6-Channel Mode is selected.



6-Channel Analog Audio Output

1. S/PDIF Out-Optical
2. MIC & Line-In
3. Line Out *(Front channels)*
4. No function
5. Line Out *(Center and Subwoofer channel)*
6. Line Out *(Rear channels)*



n 8-Channel Mode for 8-Speaker Output

Refer to the diagram and caption for the function of each jack on the back panel when 8-Channel Mode is selected.

8-Channel Analog Audio Output

1. S/PDIF Out-Optical
2. MIC & Line-In
3. Line Out *(Front channels)*
4. Line Out *(Side channels)*
5. Line Out *(Center and Subwoofer channel)*
6. Line Out *(Rear channels)*

Installing the Creative Audio Driver

You need to install the driver for Creative CA0110 to function properly before you can get access to 2-, 4-, 6- or 8- channel and SPDIF audio operations. Follow the procedures below to install the drivers for Windows 2000/ XP/ VISTA operating system.

Installation for Windows XP/ VISTA

Install Windows® XP Service Pack 1 for Windows® XP before installing the driver.

The following illustrations are based on Windows® XP environment and could look slightly different if you install the drivers in Windows® Vista.

1. Insert the Creative audio driver CD into the CD-ROM drive. The setup screen will automatically show on the screen as below.
2. Click **Next** to go to next page.

Welcome to Creative Software Setup
CREATIVE
Sound BLASTER X-Fi
Xtreme Audio
Welcome
Take full advantage of your Creative product by installing and using this software.
Click on the arrow key to continue the installation process.
Exit
Next

Important

The screens shown in this chapter may be slightly different from the latest software utility and shall be held for reference only.

3. Select your region from the list .

4. Select the language that you need from the list .

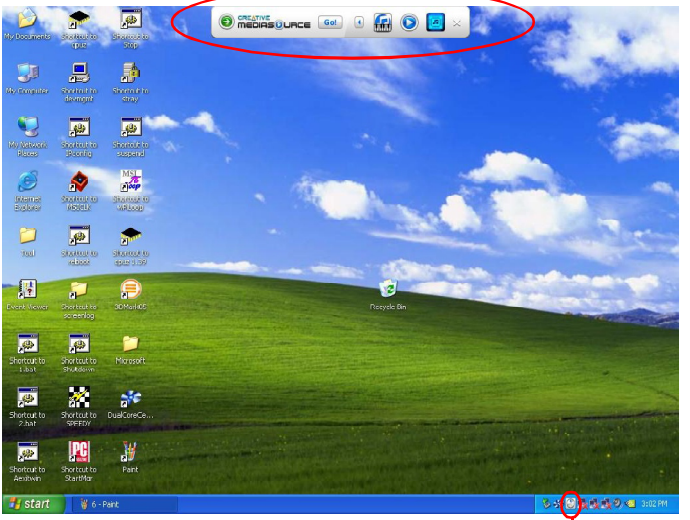
5. On the next page, click **Install** to start the installation and follow the setup instructions to complete.

6. Finally, you have to **restart** the system after the installation is done .

Software Configuration

After installing the creative audio driver, you are able to use the 2-, 4-, 6- or 8-channel and the SPDIF audio features. Double click on the creative volume control audio icon from the system tray at the lower-right corner of the screen to activate the Sound Blaster X-Fi Xtreme Audio Applications, simply click on each icon to enter the configuration screen. Or you can move the mouse cursor to the top of screen and a **Creative MediaSource Go** quick start bar will float on the desktop, simply click on each icon to enter the configuration screen.

Creative MediaSource Go quick start bar



Creative volume control icon

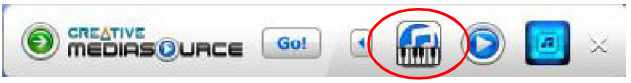
Creative MediaSource Go! Launcher

Click on the **Creative MediaSource Go! Launcher** icon to enter its configuraton screen.

Creatvie MediaSource Go! Launcher consists of various tabs such as **Programs, Product Settings, Product Support and Companion Products**. In each tab, you can access different applications, called Tasks. For more information and usage details on each Task, please refer to its online Help (simply click on the "?" button to get the online help information).

Soundfont Bank Manager

Click on the **SOUNDFONT® BANK MANAGER** icon to enter its configuraton screen.



With SoundFont Bank Manager (SFBM), you can:

click on this button to get the online help information

- Load SoundFont banks
Replace the default sounds on your computer with the high-quality sound of a SoundFont bank.

- Adjust SoundFont cache memory
Allocate SoundFont cache memory according to your needs, to better utilize the memory resources of yout computer.

- Audition presets on your computer
The virtual keyboard in SFBM allows you to audition presets quickly on your computer. You can also audition presets from an external MIDI device, such as a MIDI keyboard.

- Edit SoundFont banks
Perfrom simple editing tasks like creating new SoundFont banks, and copying presets from one SoundFont to another.

For more information and usage details on each Task, please refer to its online Help (simply click on the "?" button to get the online help information).

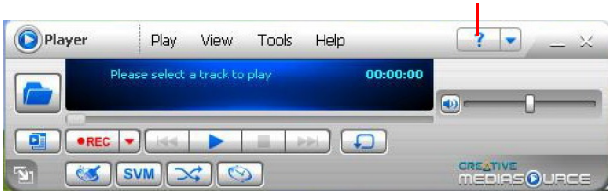
Important

SFBM is compatible with SoundFont 1.0, 2.0, and 2.1 file formats.

Creative MediaSource™ Play/ Organizer

Click on the **Creative MediaSource™ Play/ Organizer** icon to enter its configuraton screen.

Creative MediaSource™ Player/ Oraganizer is your digital music center for playing , creating, organizing and transferring digital music. This is your ultimate all-in-one digital entertainment software.
With Creative MediaSource™ Player/ Oraganizer, you can:



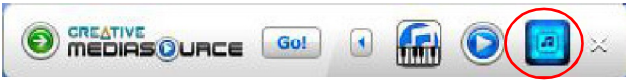
- Clean up and convert your vinyl records and cassette tapes to digital formats with the integrated recorder.
- Rip CDs and create high quality digital audio files (up to 320 kbps for WMA).
- Use the Super Rip feature on your audio CDs to get superior quality audio tracks enhanced with X-Fi Cystalizer, X-Fi CMSS-3D Surround and X-Fi CMSS-3D Headphone effects.
- Burn personalized MP3 and audio CDs with a CD-writer, and print your own CD covers.
- Organize your digital music collection with a powerful, easy to use music library.
- Search for tracks with an advanced Find feature that searches as your type.
- Transfer tracks and files seamlessly to and from your digital audio players with AudioSync and SmartFit.
- Automatically generate playlists from your music library, based on your preferences, with Smart Playlist.
- Rate each track (up to 5 stars) to automatically generate playlists of songs you like/ dislike, with Smart Playlist.
- Play Copy Control™ CDs.
- Use Smart Crossfade to enjoy continuous audio. Smart Crossfade uses crossfading and beatmatching to link tracks together.
- Add cover art to audio files.

Some features and options are available only with selected products.

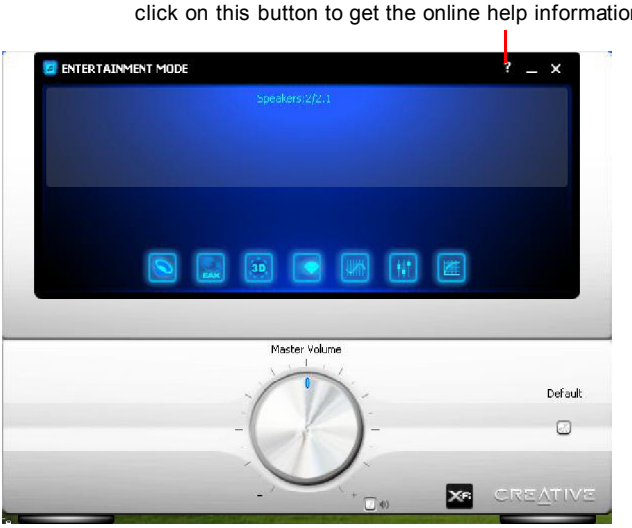
For more information and usage details on each Task, please refer to its online Help (simply click on the “?” button to get the online help information).

Entertainment Mode Console

Click on the **Entertainment Mode** icon to enter its configuraton screen.



In Entertainment Mode, you audio device is optimized for movie soundtrack and music playback.
You can configure Entertainment Mode settings in the Entertainment Mode consloe. With the Entertainment Mode console, you can:



- Adjust master volume or speaker volume, bass and treble levels.
- Adjust volume mixer settings.
- Configure playback settings for your speakers or headphones.
- Adjust equalizer settings.
- Enable environment effects.
- Enable multichannel upmixing.
- Enable virtual surround sound.
- Enhance detail and impact of audio with X-Fi™ Crystalizer™.

Some choices are different for selected audio devices.

For more information and usage details on each Task, please refer to its online Help (simply click on the “?” button to get the online help information).

The following table lists the function of each control on the main interface.

	Close button - Click on this button to close the Entertainment Mode console.
	Minimize button - Click on this button to minimize the Entertainment Mode window to the task bar.
	Help button - Click on this button to read information about the Entertainment Mode console. Select Help Contents to display the online Help. Click the Contents tab and select a topic, or click on the Search tab and search for a specific topic by entering a keyword.
	Volume control - Turn this knob to adjust master volume or speaker volume.
	Mute button - Click on this button to mute the master volume or speaker volume.
	Default button - Click on this button to revert all the settings in Entertainment Mode to the default.
	Main Display button - Click on this button to revert to the main display. This button disappears when you are in the main display.
	Speaker button - Click on this button to show speaker settings.
	Jack Sensing button - Click on this button to show the jacks connected. (Available only in Windows Vista.)
	EAX Effects button - Click on this button to display EAX Effects settings.
	X-Fi CMSS-3D button - Click on this button to show X-Fi CMSS-3D settings.
	X-Fi Crystalizer button - Click on this button to show X-Fi Crystalizer settings.
	EQ button - Click on this button to show EQ settings.
	Mixer button - Click on this button to show volume mixer settings.
	Performance button - Click on this button to show sampling rate and bit depth settings. (Available in Windows XP and Windows 2000.)

Speaker & Headphone

Click on the speaker button to enter its configuration screen.

Here you can adjust your speakers configuration. Select the type of your speaker system, and adjust the volume and cuff frequency for your subwoofer.

This is the main application to use for the following tasks:

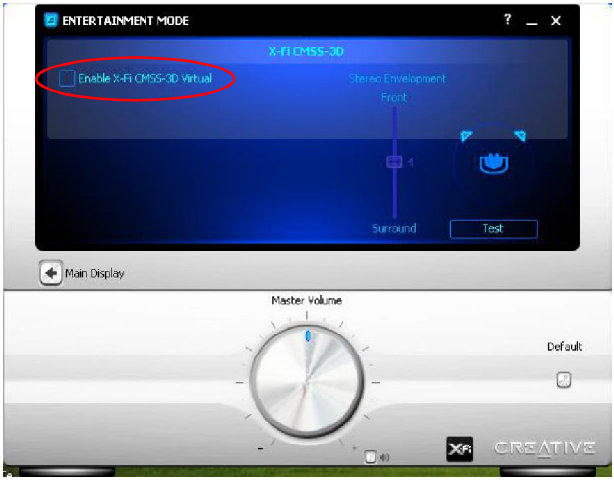
- Designating the number and configuration of speakers to use => select the speakers type that you connected.
- Testing your speakers => click on the Channel or Noise button to test the speakers.

For more information and usage details on MIXER, refer to its online Help (click on the "?" button).

X-Fi CMSS-3D

Click on the X-Fi CMSS-3D button to enter its configuration screen.

Creative MultiSpeaker Surround (CMSS) 3D makes ordinary two-channel (Left and Right Stereo) sound seem to surround you, even through only two speakers. For users with 5.1, 6.1, 7.1 multichannel speaker systems, CMSS can also simulate surround sound from ordinary stereo. This is useful for watching DVDs and VCDs, which contain only stereo soundtracks, or listening to CDs with two-channel audio. To enable the CMSS 3D configuration mean by check the **Enable X-Fi CMSS-3D Virtual** item. Then you can select CMSS for multichannel audio enhancement on 4/4. 1, 5.1, 6.1 or 7.1 speaker systems.



Important

*To enable the **X-Fi CMSS-3D Virtual** item when you want to use 4/ 5.1/ 7. 1 channel audio-out.*
The multichannel upmix depends on your speakers and the speaker settings. For example, if you want to upmix to 5.1 channels, make sure you have connected 5.1-channel speakers to audio jacks, and have selected the 5.1 speaker option in your speakers & headphone setup.

Appendix B
nVidia RAID

NVIDIA brings Redundant Array of Independent Disks (RAID) technology—which is used by the world's leading businesses—to the common PC desktop. This technology uses multiple drives to either increase total disk space or to offer data protection. For all levels, RAID techniques optimize storage solutions by using multiple disks grouped together and treating them as a single storage resource.

MSI
MICRO-STAR INTERNATIONAL

Introduction

System Requirement

Operating System Support
NVRAID supports the following operating systems:
Windows XP, Windows Vista

RAID Arrays

NVRAID supports the following types of RAID arrays described in this section:
RAID 0: RAID 0 defines a disk striping scheme that improves the disk read and write times for many applications.
RAID 1: RAID 1 defines techniques for mirroring data.
RAID 0+1: RAID 0+1 combines the techniques used in RAID 0 and RAID 1 arrays.
RAID 5: RAID 5 defines techniques for parity data.
Spanning (JBOD): JBOD provides a method for combining drives of different sizes into one large disk

Summary of RAID Configurations

Array	Uses	Advantages	Drawbacks	# Hard Disks	Fault Tolerance
RAID 0	Non-critical data requiring high performance.	High data throughput.	No fault tolerance.	multiple	None
RAID 1	Small databases or any other small capacity environment requiring fault tolerance.	100% data redundancy.	Requires 2 drives for the storage space of 1 drive.	2	Yes
RAID 0+1	Critical data requiring high performance.	Optimized for both 100% data redundancy and performance. Allows spare disks.	Requires 2 drives for the storage space of 1 drive—the same as RAID level 1.	4+	Yes
RAID 5	Critical data and reasonable level of performance.	Fault tolerance and better utilization of disk space.	Decreased write performance due to parity calculations. Requires at least three drives.	3+	Yes
JBOD	Combining odd size drives into one big drive	Combines and uses the capacity of odd size drives.	Decreases performance because of the difficulty in using drives concurrently or to optimize drives for different uses.	Multiple	No

RAID Configuration

Basic Configuration Instructions

The following are the basic steps for configuring NVRAID:

Non-Bootable RAID Array

1. Choose the hard disks that are to be RAID enabled in the system BIOS. (To enable the **SATA 0/ 1/ 2/ 3/ 4/ 5/ 6** in **nVidia RAID Setup** of **Integrated Peripherals** in BIOS.)
2. Specify the RAID level, either Mirroring (RAID 1), Striping (RAID 0), Striping and Mirroring (RAID 0+1), RAID 5 or JBOD and create the desired RAID array.
3. Enter the Windows OS, run the Windows nForce Setup application and install the RAID software. (Check p.C-9 for details.)
4. Initialize the NVRAID Array Disks.

Bootable RAID Array

1. Choose the hard disks that are to be RAID enabled in the system BIOS. (To enable the **SATA 0/ 1/ 2/ 3/ 4/ 5/ 6** in **nVidia RAID Setup** of **Integrated Peripherals** in BIOS.)
2. Specify the RAID level, either Mirroring (RAID 1), Striping (RAID 0), Striping and Mirroring (RAID 0+1), RAID 5 or JBOD and create the desired RAID array.
3. Boot from the Windows CD, use the floppy disk that has the RAID driver to copy and install the nForce RAID software. (Check p.B-7 for details.)
4. Initialize the NVRAID Array Disks.

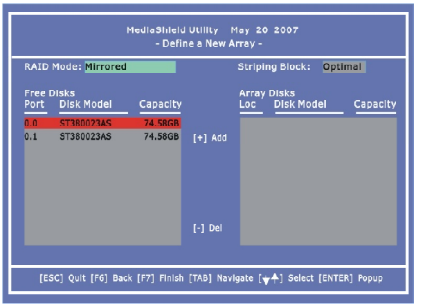
Setting Up the NVRAID BIOS

Be sure to enable the **RAID** function in **SATA Channel** of **Integrated Peripherals** in BIOS before configuring the NVRAID BIOS. After that press F10 to save the configuration and exit. The PC will reboot right away. Then enter the RAID BIOS Setup by pressing **F10** when prompted, and follow the procedures described below to set up the NVRAID BIOS.

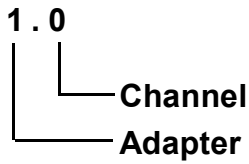
NVRAID BIOS setup lets you choose the RAID array type and which hard drives you want to make part of the array.

Entering the RAID BIOS Setup

1. After rebooting your PC, wait until you see the RAID software prompting you to press **F10**. The RAID prompt appears as part of the system POST and boot process prior to loading the OS.
2. Press **F10**, and the NVIDIA RAID Utility --- **Define a New Array** window will appear.
   The default **RAID Mode** is set to ***Mirroring*** and **Striping Block** is set to ***Optimal***.



Understanding the "Define a New Array" Window
Use the Define a New Array window to
• Select the RAID Mode
• Set up the Striping Block
• Specify which disks to use for the RAID Array
The SATA ports are called channels and they are associated with adapters. The first digit in the Location field defines the adapter that the port is associated with. The 2nd digit defines the channel.



In the example above, 1.0 means the hard drive is attached to Adapter 1, Channel 0. The following is a list of all possible combinations:

Serial ATA

1.0	Controller 1, Channel 0 (SATA1)
1.1	Controller 1, Channel 1 (SATA2)
2.0	Controller 2, Channel 0 (SATA3)
2.1	Controller 2, Channel 1 (SATA4)
3.0	Controller 3, Channel 0 (SATA5)
3.1	Controller 3, Channel 1 (SATA6)

Important

There is no such thing as Slave drive in Serial ATA. All drives are considered to be Master since there is a one to one connection between the drive and the controller.

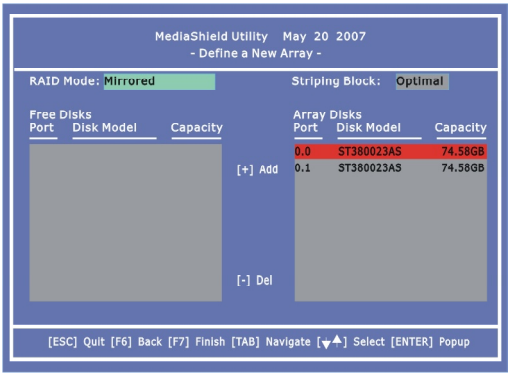
Using the Define a New Array Window
If necessary, press the tab key to move from field to field until the appropriate field is highlighted.

• Selecting the RAID Mode
By default, this is set to [Mirroring]. To change to a different RAID mode, press the down arrow key until the mode that you want appears in the RAID Mode box—either [Mirroring], [Striping], [RAID5], [Spanning], or [Stripe Mirroring].

• Selecting the Striping Block Size
Striping Block size is given in kilobytes, and affects how data is arranged on the disk. It is recommended to leave this value at the default [Optimal], which is 32KB, but the values can be between [4 KB] and [128 KB].

• Assigning the Disks
The disks that you enabled from the RAID Config BIOS setup page appear in the **Free Disks** block. These are the drives that are available for use as RAID array disks. To designate a free disk to be used as a RAID array disk,

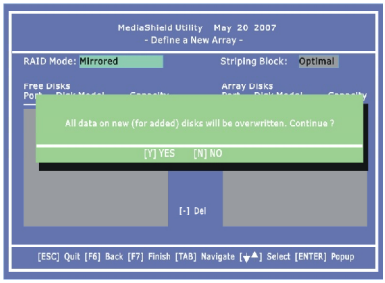
1. Tab to the **Free Disks** section. The first disk in the list is selected.
2. Move it from the Free Disks block to the Array Disks block by pressing the right arrow key (-->). The first disk in the list is moved, and the next disk in the list is selected and ready to be moved.
3. Continue pressing the right-arrow key (<--) until all the disks that you want to use as RAID array disks appear in the **Array Disks** block.



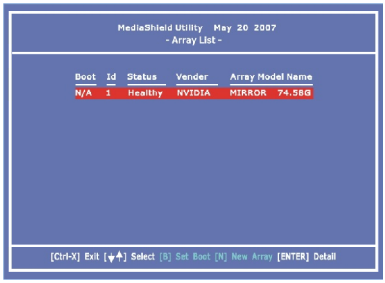
It shows that two disks have been assigned as RAID1 array disks in the figure above.

Completing the RAID BIOS Setup

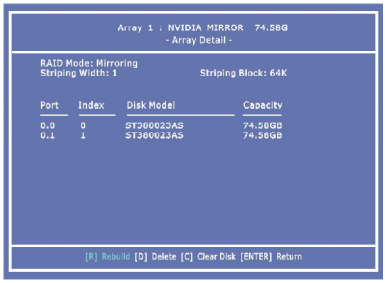
1. After assigning your RAID array disks, press **F7.** The Clear disk data prompt appears.


MediaShield Utility May 20 2007
- Define a New Array -
RAID Mode: Mirrored
Striping Block: Optimal
Free Disks
Array Disks
All data on new (for added) disks will be overwritten. Continue ?
[Y] YES [N] NO
[-] Del
[ESC] Quit [F6] Back [F7] Finish [TAB] Navigate [↑↓] Select [ENTER] Popup

2. Press **Y** if you want to wipe out all the data from the RAID array, otherwise press **N**. You must choose **Yes** if the drives were previously used as RAID drives. The **Array List** window appears, where you can review the RAID arrays that you have set up.


MediaShield Utility May 20 2007
- Array List -
Boot Id Status Vender Array Model Name
N/A 1 Healthy NVIDIA MIRROR 74.58G
[Ctrl-X] Exit [↑↓] Select [B] Set Boot [N] New Array [ENTER] Detail

3. Use the arrow keys to select the array that you want to set up, then press **Enter.** The **Array Detail** window appears.


Array 1 : NVIDIA MIRROR 74.58G
- Array Detail -
RAID Mode: Mirroring
Striping Width: 1
Striping Block: 64K
Port Index Disk Model Capacity
0.0 0 ST3000523AS 74.58GB
0.1 1 ST3000523AS 74.58GB
[R] Rebuild [D] Delete [C] Clear Disk [ENTER] Return

4. If you want to mark this disk as empty and wipe out all its contents then press **C**.
5. At the prompt, press **Y** to wipe out all the data, otherwise press **N**.
6. Press **Enter** again to go back to the previous window and then press **Ctrl+X** to exit the RAID setup. Now that the RAID setup has been configured from the RAID BIOS, the next step is to configure and load NVRAID drivers under Windows, as explained in “Installing the NVIDIA RAID Software Under Windows” on C-9.

Installing Driver

Install Driver in Windows Vista / XP

† **New Windows Vista / XP Installation**

The following details the installation of the drivers while installing Windows XP / 2000.

1. When you start installing Windows XP and older operating systems, you may encounter a message stating, "Setup could not determine the type of one or more mass storage devices installed in your system". If this is the case, then you are already in the right place and are ready to supply the driver. If this is not the case, then press F6 when prompted at the beginning of Windows setup.
2. Press the "S" key to select "Specify Additional Device".
3. You should be prompted to insert a floppy disk containing the NVIDIA RAID driver into the A: drive,and then press ENTER.

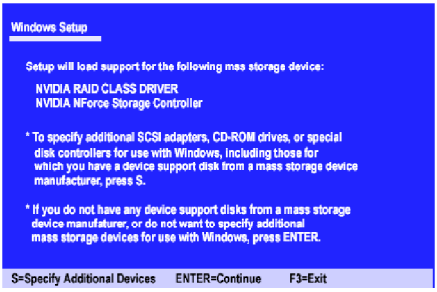
Important

*Please follow the instruction below to make an **"NVIDIA RAID Driver"** for yourself.*

1. Insert the MSI CD into the CD-ROM drive.
2. Click the "Browse CD" on the Setup screen.
3. Copy all the contents in the \\Chipset\nVidia\System\C72+MCP55\IDE\WinXP\Sataraid to a formatted floppy disk.
*4. The driver diskette for **NVIDIA RAID Controller** is done.*

4. You should be shown a list of available NVRAID Adapters.
5. Select the "NVIDIA RAID Driver" and press ENTER.
6. Press "S" again at the Specify Devices screen, then press ENTER.
7. Select "NVIDIA nforce Storage Controller" and then press ENTER. The following Windows Setup screen appears listing both drivers:

   For Windows Vista:
8. During the Operating system installation, after selecting the location to install Vista click on "Load Driver" button to install a RAID driver.
9. When prompted, insert the floppy disk or media (Floppy, CD/DVD or USB) you created in step 3 and press Enter.
10. You should be shown a list of available NVRAID controllers.
11. Select the "NVIDIA nforce RAID Controller" and press ENTER.


Windows Setup
Setup will load support for the following mass storage device:
NVIDIA RAID CLASS DRIVER
NVIDIA NForce Storage Controller
* To specify additional SCSI adapters, CD-ROM drives, or special disk controllers for use with Windows, including those for which you have a device support disk from a mass storage device manufacturer, press S.
* If you do not have any device support disks from a mass storage device manufaturer, or do not want to specify additional mass storage devices for use with Windows, press ENTER.
S=Specify Additional Devices
ENTER=Continue
F3=Exit

10. Press **Enter** to continue with Windows XP Installation. Be sure to leave the floppy disk inserted in the floppy drive until the blue screen portion of Windows XP installation is completed, then take out the floppy.
11. Follow the instructions on how to install Windows XP. After Windows XP is completely installed, it is recommended that you install the the RAID management tool.

Important

Each time you add a new hard drive to a RAID array, the RAID driver will have to be installed under Windows once for that hard drive. After that, the driver will not have to be installed.

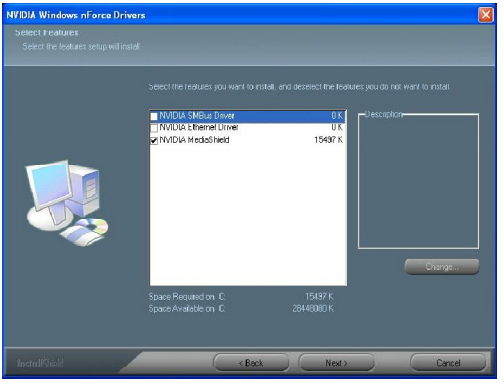
NVIDIA RAID Utility Installation

Installing the NVIDIA MediaShield Software Under Windows (for Non-bootable RAID Array)

The existing Windows Serial ATA driver must be upgraded to use the NVIDIA Serial ATA driver.

This section describes how to run the setup application and install the RAID software which will upgrade the Windows SATA driver and install the RAID software.

1. Start the NVIDIA nForce Drivers installation program to open the NVIDIA Windows nForce Drivers page.

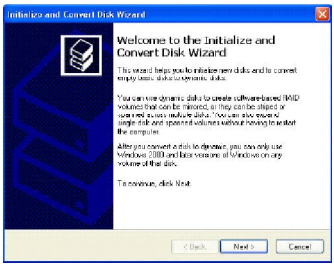

NVIDIA Windows nForce Drivers
Select Features
Select the features setup will install.
Select the features you want to install, and deselect the features you do not want to install.
NVIDIA SMBus Driver 0 K
NVIDIA Ethernet Driver 0 K
NVIDIA MediaShield 15497 K
Description
Change...
Space Required on C: 15497 K
Space Available on C: 28448080 K
InstallShield
< Back
Next >
Cancel

2. Select the NVIDIA MediaShield.
3. Click **Next** and then follow the instructions.
4. After the installation is completed, be sure to reboot the PC.
5. After the reboot, initialize the newly created array.

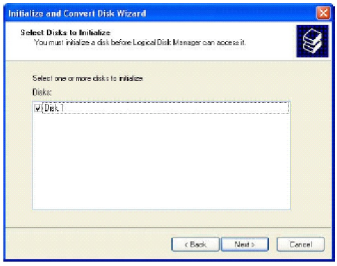
Initializing and Using the Disk Array

The RAID array is now ready to be initialized under Windows.

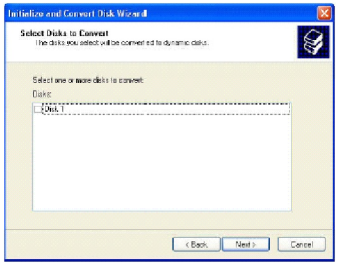
1. Launch Computer Management by clicking “Start” --> “Settings” --> “Control Panel” then open the “Administrative Tools” folder and double click on “Computer Management”.
2. Click “Disk Management” (under the “Storage” section). The Initialize and Convert Disk Wizards appears.



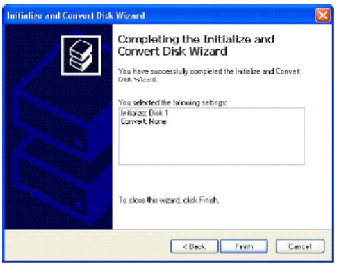
3. Click **Next**. The Select Disks to Initialize window appears. The disks listed depend on how many arrays you have configured.


Initialize and Convert Disk Wizard
Select Disks to Initialize
You must initialize a disk before Logical Disk Manager can access it.
Select one or more disks to initialize:
Disks:
Disk 1
< Back
Next >
Cancel

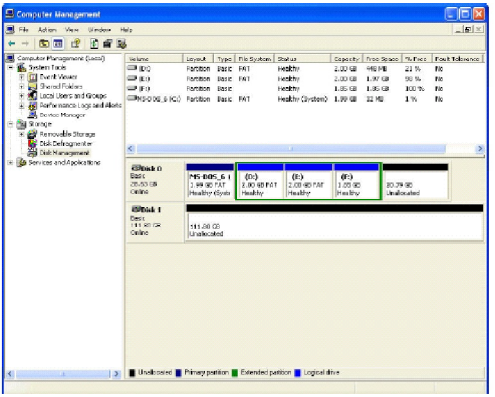
4. Click **Next**. The Select Disks to Convert window appears.



5. Check the disk in the list if you want to make the array a dynamic disk, then click **Next**. The Completing the Initialize and Convert Disk Wizard window appears.


Initialize and Convert Disk Wizard
Completing the Initialize and Convert Disk Wizard
You have successfully completed the Initialize and Convert Disk Wizard.
You selected the following settings:
Initialize: Disk 1
Convert: None
To close this wizard, click Finish.
< Back
Finish
Cancel

6. Click **Finish**. The “Computer Management” window appears.



The actual disks listed will depend on your system, and the unallocated partition is the total combined storage of two hard disks. You must format the unallocated disk space in order to use it.

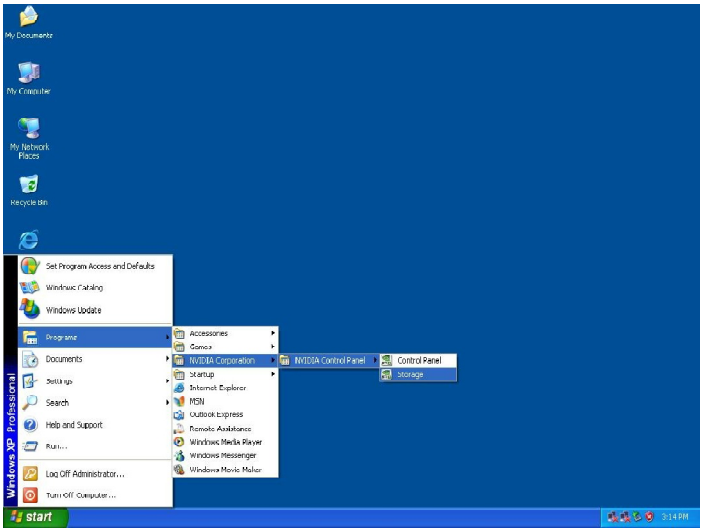
7. Format the unallocated disk space. Right click “Unallocated space”, select “New Partition…” and follow the wizard. After the drive has been formatted, it is ready for use.

Using the NVMediaShield Software

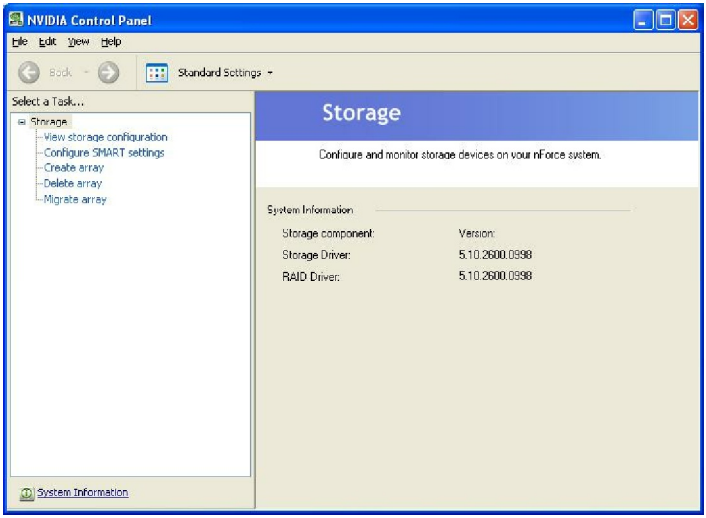
Accessing the Storage Page

To access the NVIDIA Control Panel Storage page:

1. Click Star-> Programs-> NVIDIA Corporation-> NVIDIA Control Panel-> Storage.



2. The NVIDIA Control Panel - **Storage** page appears.



Using the Storage Page

From the Storage page, you can accomplish the following tasks:

- **Create an Array**
- **Delete an Array**
- **Rebuild an Array**
- **Synchronize an Array**
- **Designate a Spare Disk**
- **Remove a Spare**
- **Migrate an Array**
- **View Storage Information**

Create an Array

This option is available only if there are free disks that are RAID-enabled.
Click Create array to start the Create Array Wizard and then follow the instructions.
You can press **F1** to access the online help that walks you through the Wizard with step-by-step instructions.

Delete an Array

This option is available only if RAID arrays have been created.
Click Delete array to start the Delete Array Wizard and then follow instructions.
You can press **F1** to access the online help that walks you through the Wizard with step-by-step instructions.

Rebuild an Array

About Rebuilding

Rebuilding is the process of restoring data to a hard drive from other drives in the array. For example, if you have a three disk RAID 5 array and one of the drives fails, you will need to replace the failed drive with a new one, and rebuild the array to re-generate the lost data on the newly added drive.
Rebuilding applies only to fault-tolerant arrays such as RAID 1, RAID 0+1, or RAID 5 Arrays.

Instructions

Click **Rebuild array** to start the Rebuild Create Array Wizard and then follow the instructions.
You can press **F1** to access the online help that walks you through the Wizard with step-by-step instructions.
The rebuilding process takes some time to complete, and occurs in the background so as not to affect the performance of the system.

Synchronize an Array

Synchronizing an array will force a rebuild of redundancy or parity. The operation applies to any fault-tolerant array such as RAID 1, 0+1 and RAID 5.
Click **Synchronize array** to start the Synchronize Array Wizard and then follow instructions.

You can press **F1** to access the online help that walks you through the Wizard with step-by-step instructions.

Designate a Spare Disk

About Spare Disks

You can designate a hard drive to be used as a spare drive for a RAID 1, RAID 0+1 or RAID 5 array2. The spare drive can take over for a failed disk. MediaShield RAID supports two types of spare drives:

Free Disk

A free disk is a disk that is not part of any RAID array, but can be used by any available RAID 1, RAID 0+1, or RAID 5 array that requires another disk when one of its disks crashes or becomes unusable. The process is automatic and requires no user interaction.

Example: A system may have four hard disks where one disk is used to boot the OS, two hard drives are set up in a mirrored array, and a fourth hard disk is set up as a free disk. If one of the mirrored array drives fails, the free disk will be assigned automatically to the mirrored array to replace the failed disk.

Dedicated Disk

A dedicated free disk is a disk that is assigned to a RAID 1, RAID 0+1, or RAID 5 array. The dedicated disk is used by that array only when needed - for example, during a system crash where a RAID mirrored drive is broken. The dedicated disk can be used only by the array that it is assigned to and not by any other array, unlike a free disk which can be used by any available RAID 1, RAID 0+1, or RAID 5 array.

To mark a disk as dedicated (reserve it for use by a specific array), you must have at least one free disk and you must also have at least two RAID 1, RAID 0+1, or RAID 5 arrays created.

Requirements for Designating a Spare Disk

The Designate Spare option on the Storage page appears only if all the following conditions are met.

- There must be at least two fault tolerant arrays already created.
- There must be at least one free disk with capacity equal to or greater than the smallest disk in the given fault tolerant array.
  For example, if a mirror array is created with disk capacities of 40 GB and 80 GB, there should be at least one free disk available of capacity equal to or greater than 40GB to be used as a spare disk for that array.

Instructions

Click **Designate spare** to start the Designate Spare Wizard and then follow instructions.

You can press **F1** to access the online help that walks you through the Wizard with step-by-step instructions.

Remove a Spare

The Remove spare option appears only if you have a a RAID array with a spare disk allocated to it.

Click **Remove spare** to start the Remove Spare Wizard and then follow the instructions.

You can press **F1** to access the online help that walks you through the Wizard with step-by-step instructions.

Migrate an Array

In a traditional RAID environment, when a user wants to change the current state of a disk or a current array to a new RAID configuration, the process of reconfiguring the new array involves multiple steps. The user must back up the data, delete the array, re-boot the PC, and then reconfigure the new array.

MediaShield RAID allows the end user to change the current state of the disk or array to another with a one-step process called "Migrating". This section describes the NVIDIA Migrating process and explains how to use Migrating to convert from one RAID array type to another.

General Migrating Requirements

- The new array capacity must be equal to or greater than the previous array. For example, it is possible to migrate from a RAID 1 array to a RAID 0 array as long as the RAID 0 array is the same size as (or larger than) the RAID 1 array.
- The number of disks in the new array cannot be less than the number of disks in the original array.
- You cannot migrate
  - To or from a JBOD (Spanning) array
  - From RAID 1 to RAID 1
  - From RAID 0+1 to RAID 1
  - From RAID 5 to 1

Migrating to an Array Larger Than 2 TB

Your disks must be partitioned using the GUID partition table (GPT) if you plan to migrate to an array with greater than 2 TB storage.

If your original array is not a GPT disk and you expand your array's capacity using the migration feature to over 2 TB, you will not be able to access the additional storage above 2 TB in the new array. To use the additional storage in this situation, back up your data, repartition the array using GPT, then restore your data to the new volume.

Important

Be sure to make the volume dynamic if you plan to have more than four partitions.

Specific Migrating Requirements
The following table lists the disk requirements for a new RAID array for various migrating combinations.

From	To	New Array Disk Requirements
RAID 0	RAID 0	m > n Number of disks in the new array must be greater than the original array.
	RAID 1	m =2, n =1 RAID 1 array must include two disks, converted from a one disk RAID 0 array.
	RAID 0+1	m >= 2 x n Number of RAID 0+1 disks must be equal to or greater than twice the number of RAID 0 disks.
	RAID5	m >= n+1
RAID 1	RAID 0	No additional restrictions.
	RAID 1	** Not a valid combination **
	RAID 0+1	No additional restrictions.
	RAID 5	m >= 3
RAID 0+1	RAID 0	m >= n2 Number of RAID 0 disks must be equal to or greater than half the number of RAID 0+1 disks.
	RAID 1	** Not a valid combination **
	RAID 0+1	** Not a valid combination **
	RAID 5	m >= (n/2 + 1)
RAID 5	RAID 0	m >= n - 1
	RAID 1	** Not a valid combination **
	RAID 0+1	m >= 2 x (n -1) ; where m is an even number of disks.
	RAID 5	m >= n

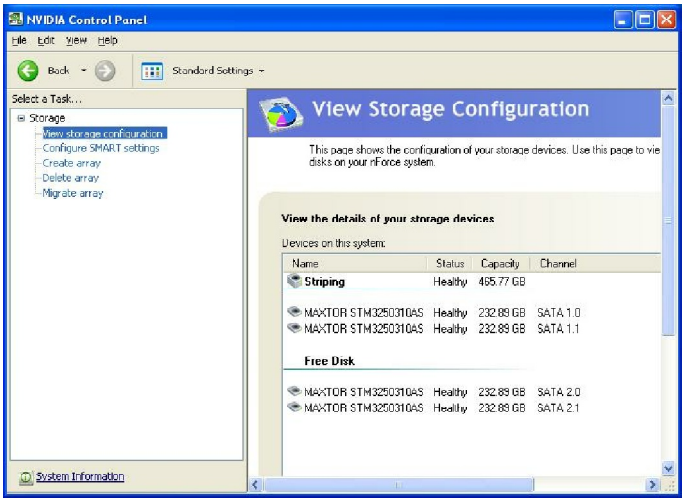
Instructions
Click **Migrate array** to start the Migrate Array Wizard and then follow instructions. You can press **F1** to access the online help that walks you through the Wizard with step-by-step instructions.

View Storage Information

- You can use the Storage page to view the following storage information about the hard drives in your system:
  - Which RAID arrays are set up
  - The process state of each array
  - Which drives are configured for each RAID array in your system
  - Which drives are designated as free disks
  - Information about each drive, such as size and model
- You can also launch various Wizards-such as the Create Array Wizard, Delete Array, and Migrate Array Wizard-from the list of links in the Related tasks section of the side menu.

Instructions

Click **View Storage Configuration** to open the associated page.



The View Storage Configuration page provides the following information:

- **Name:** Indicates the RAID array type and drive model information
- **Status:** Indicates the process state of the array.
  For example, "Healthy", "Rebuilding", "Initializing", "Synchronizing", or "Upgrading"
- **Capacity:** Indicates the size of each hard drive.
  For example, "250 GB"
- **Channel:** Indicates the adapter and channel (SATA port) information for each hard drive.
  For example, "1.0." means the hard drive is attached to Adapter 1, Channel 0.

Appendix C
Dual Core Center

Dual CoreCenter, the most useful and powerful utility that MSI has spent much research and efforts to develop, helps users to monitor or configure the hardware status of MSI Mainboard & MSI Graphics card in windows, such as CPU/GPU clock, voltage, fan speed and temperature.
Before you install the Dual CoreCenter, please make sure the system has meet the following requirements:

1. Intel Pentium4 / Celeron, AMD Athlon XP/ Sempron or compatible CPU with PCI Express slot.
2. 256MB system memory.
3. CD-ROM drive for software installation.
4. Operation system: Windows XP.
5. DotNet Frame Work 2.0

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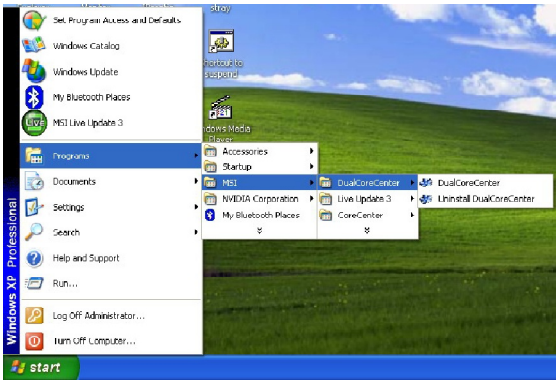
Activating Dual Core Center

Once you have your Dual Core Center installed (locate the setup source file in the setup CD accompanying with your mainboard, path: **Utility --> MSI Utility --> Dual Core Center**), it will have an icon in the system tray, a short cut icon on the desktop, and a short cut path in your "Start-up" menu. You may double-click on each icon to enable Dual Core Center.

short-cut icon in the system tray



short-cut path in the start-up menu (path: Start-->Programs-->MSI--> DualCoreCenter-->DualCoreCenter)

Main

Before using this utility, we have to remind you: only when installing the MSI V044 (V044 has to install with the version 8.26 or newer driver)/ V046 or V060 graphics card can activate the full function of this utility. If you install a graphics card of other brand, only hardware status of the MSI mainboard would be available.

Introduction:

Click each button appearing above to enter sub-menu to make further configuration or to execute the function.

MB

Click MB button to read current CPU temperature, FSB and CPU clock of mainboard will show below.

VGA

Click VGA button to read current GPU temperature, GPU clock and memory clock of graphics card will show below.

DOT

Click DOT button to enable or disable the Dynamic Overclocking Technology.

AV/ Game/ Office/ Silence/ Cool

MSI provides five common settings for different environments. The settings had been set to optimal values to reach better performance in each environment. Click the button you need.

Important

Before clicking the AV/ Game/ Office/ Silence or Cool button, select Smooth mode or Sharp mode to decide whether you want the system to reach the optimal values smoothly or quickly.

Sharp mode ***Smooth mode***

Clock

In this sub-menu, you can adjust and monitor the clocks of MB and graphics card.

Voltage

In this sub-menu, you can adjust and monitor the voltages of MB and graphics card.

FAN Speed

In this sub-menu, you can adjust and monitor the fan speeds of MB and graphics card.

Temperature

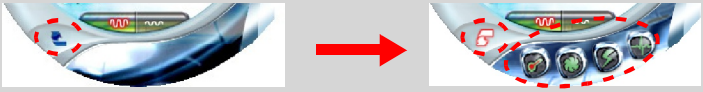
In this sub-menu, you can monitor the temperatures of MB and graphics card.

User Profile

In this sub-menu, you can set the values of clock, voltage and fan speed by your need and save them in a profile. You can save 3 profiles for further use.

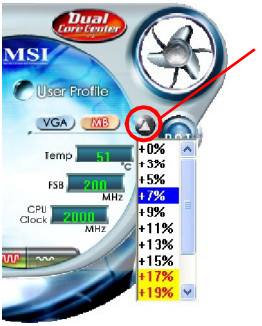
Important

Click on the icon , the clock, voltage, fan, and temperature buttons will appear beside the icon.

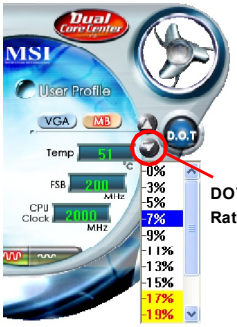


DOT (Dynamic OverClocking)

Dynamic Overclocking Technology is an automatic overclocking function, included in the MSI™'s newly developed Dual CoreCenter Technology. It is designed to detect the loading of CPU/ GPU while running programs, and to over-clock automatically. When the motherboard detects that the loading of CPU is exceed the default threshold for a time, it will speed up the CPU and fan automatically to make the system run smoother and faster. When the graphics card detects that the loading of GPU is exceed the default threshold for a time, it will speed up the GPU, memory, fan and voltage automatically to make the system run smoother and faster. When the CPU/ GPU is temporarily suspending or staying in low loading balance, it will restore the default settings instead. Usually the Dynamic Overclocking Technology will be powered only when users' PC runs huge amount of data, like 3D games or video process, and the motherboard/ graphicd card need to be boosted up to enhance the overall performance. There will be several selections when you click the DOT rate button (include increase rate and decrease rate buttons), to select the DOT level, then you have to click the DOT button to apply the DOT function.



DOT FSB-UP Rate button



DOT FSB-DOWN Rate button

Important

Even though the Dynamic Overclocking Technology is more stable than manual overclocking, basically, it is still risky. We suggest user to make sure that your CPU can afford to overclock regularly first. If you find the PC appears to be unstable or reboot incidentally, it's better to lower the level of overclocking options. By the way, if you need to conduct overclocking manually, please do not to apply the DOT function.

Clock

In the **Clock** sub-menu, you can see clock status (including FSB/ CPU clock of mainboard and GPU/ memory clock of graphics card) of your system. And you can select desired value for overclocking. There will be several items for you to select for overclocking after you click button. You can click the plus sign button to increase the clock, or click the minus sign button to decrease the clock. And finally, click the Apply button to apply the values adjusted. If you do not want to apply the adjustments, click the Cancel button to cancel. Or click the Default button to restore the default values.

On the underside, it shows the graphs of the clocks. Only the curves of the item which the button is lit up with red color will be shown.

Important

*In the user profile, clicking the **Save** button can save the changes to it. In the default profile, the Save button is not available.*

Voltage

In the **Voltage** sub-menu, you can see voltage status (including Vcore, memory, GPU voltage... etc.) of your system, and you can select desired value for overclocking. It will show several items to select for overclocking after you click the button. You can click the plus sign button to increase the voltage, or click the minus sign button to decrease. And finally, click the Apply button to apply the adjustments. If you do not want to apply the adjustments, click the Cancel button to cancel. Or click the Default button to restore the default values.

On the underside, it shows the graphs of the voltages. Only the curves of the item which the button is lit up with red color will be shown.

Important

*In the user profile, clicking the **Save** button can save the changes to it. In the default profile, the Save button is not available.*

FAN Speed

In the **FAN Speed** sub-menu, you can read fan status of your system. Select higher speed for better cooling effect. There are several sections for you to change the fan speed to a section after clicking button. Click the plus sign button to increase the fan speed to a section, or click the minus sign button to decrease. Or click the Default button to restore the default values.

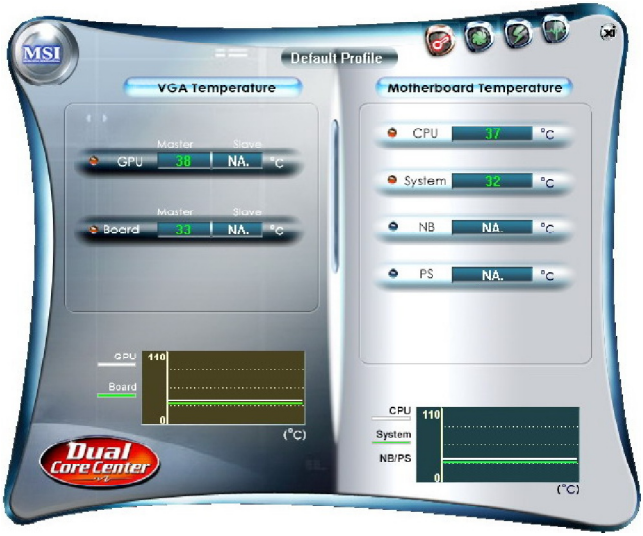
On the underside, it shows the graphs of the fan speed. Only the curves of the item which the button is lit up with red color will be shown.

Important

1. *When you set the fan speed manually, please make sure to disabled the "CPU Smart FAN Target" item in the BIOS.*
2. *In the user profile, clicking the* ***Save*** *button can save the changes to it. In the default profile, the Save button is not available.*

Temperature

In the **Temperature** sub-menu, you can see temperature status of your system.

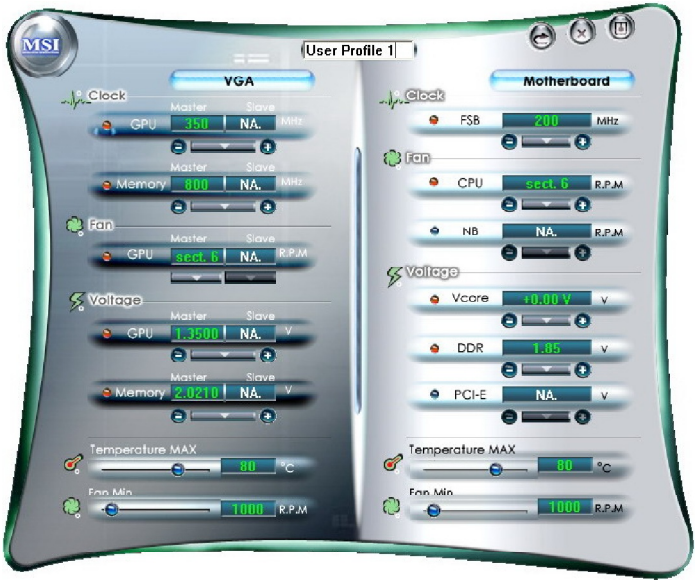


On the underside, it shows the graphs of the temperatures. Only the curves of the item which the button is lit up with red color will be shown.

User Profile

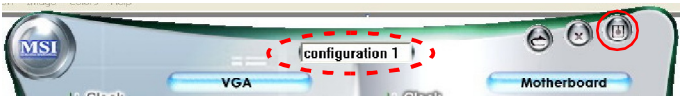
In the **User Profile** sub-menu, click the setting button that besides the user profile bar, and the next screen will appear.

Here you can define the clock/ fan speed/ voltage by your need, click the button to choose a value quickly, or click the plus / minus sign button to increase/ decrease the value.



Use the draw bar to set the max system temperature. When the system temperature exceeds the threshold you defined, the system will pop up a warning message and shut down the system.
Use the draw bar to set the minimal fan speed. When the fan speed is lower than the threshold you defined, the system will pop up a warning message.

After setting all values you need, you can change the user profile name in the box then click the save button to save all changes in a profile.



Finally, you can choose the user profile by click the button in the left side and click the Apply button to load the user profile.